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EDITOR'S NOTE

> There's more to learning from **net** than just reading our practical articles. Many of the projects come with screencasts created by our authors. So you can read the article, check out the code on GitHub or CodePen, then sit back and watch it all in action on YouTube.

This issue we have more than two hours of video tutorials for you! James Steinbach walks you through how to switch from CSS to Sass in WordPress, Aaron Gustafson explains patterns for simple, accessible forms, Jon Bell introduces Pixate, and Lukas Ruebbelke demonstrates how to build a real-time leaderboard with Firebase and AngularJS. And that's not all. Flip to page 96 for a free course

about deploying websites, courtesy of Ryan Irelan's Mijingo (mijingo.com/products), which offers great video tutorials for web designers and developers. Deploying Websites (usually \$14.99) covers seven popular methods to get your work on the web, from FTP to Capistrano.

Finally, we have a free one-month membership to SketchCasts (sketchcasts.net), a growing library of video tutorials all about Sketch. Turn to page 80 for details. Enjoy!

Oliver Lindberg, editor
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 @oliverlindberg

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VAL HEAD



Val is a designer who loves web animation. On page 68 she explains how to create amazing interface animations
w: valhead.com
t: @vlh

RAFAEL CONDE



Rafael is the co-founder of SketchCasts. On page 76 he runs down his top 15 handy Sketch plugins
w: rafaelconde.net
t: @rafahari

PAUL BOAG



Paul is a digital consultant, speaker and author. On page 28 he argues that good UX design starts in the boardroom
w: boagworld.com
t: @boagworld

AARON GUSTAFSON



Aaron is a progressive enhancement evangelist. Turn to page 98 to find out how to improve your HTML forms
w: aaron-gustafson.com
t: @aarongustafson



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* VOICES

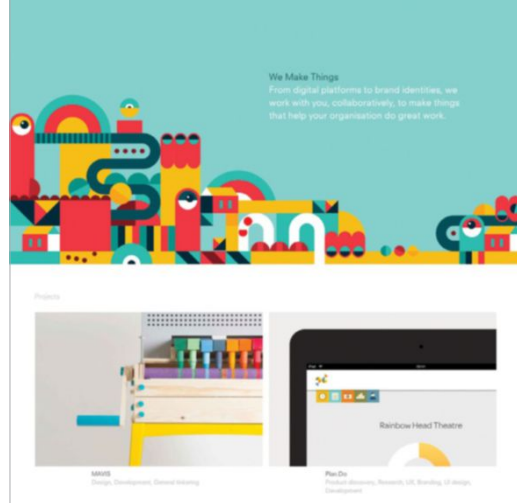
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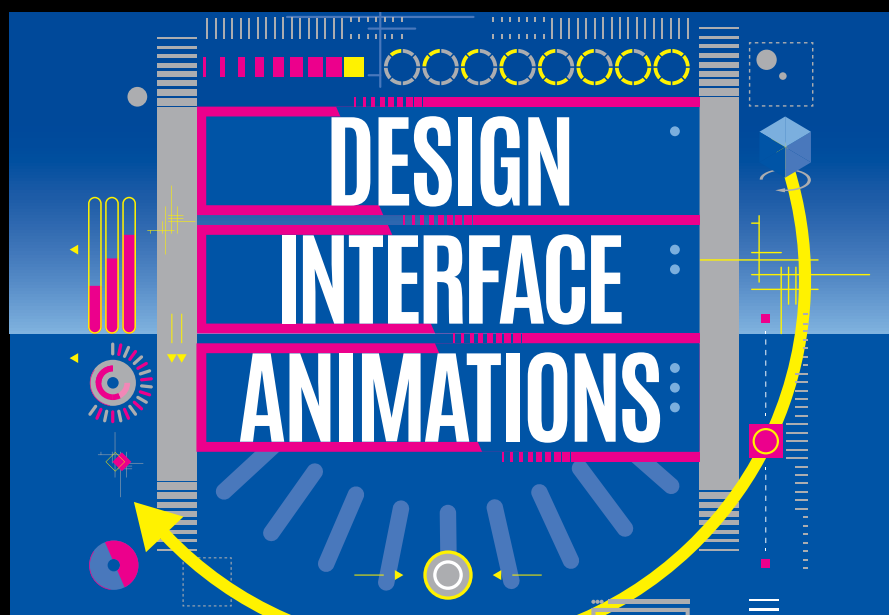
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* REGULAR

GALLERY 44

> **Sam Kapila** shows off some of the best sites around, including Freese Coffee's vibrant new microsite



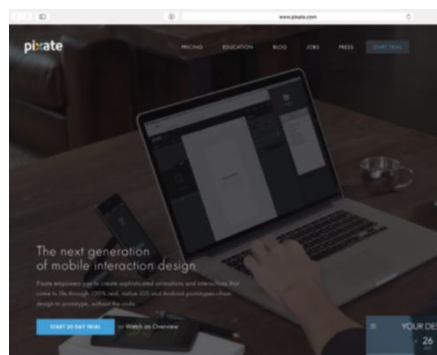
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> **Jon Bell** explains how to use this powerful tool to build a moving app prototype



EXCLUSIVE VIDEO TUTORIALS!

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NETWORK

Mail, tweets,
posts and rants

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CHRISTMAS TIMEWARP

The most incredible thing just happened today. I was walking with my dog and near our building, on a bench, there was a .net magazine issue #5 from April 1995! What are the odds when just yesterday I got an email from **net** saying it's celebrating its 20th year. All of that just happened here in Tel Aviv, Israel! It is a small world. Here is a photo of my girlfriend and .net issue #5 April 1995 [on the right].

Liran Tadmor, Tel Aviv, Israel
Wow. This is amazing! And what a magical Christmas surprise (Liran found the copy on Christmas Day)! We hope you enjoyed the issue, even though it's 20 years out of date. Shall we send you a new copy? When you're done with it, leave it on the bench and maybe in

20 years we'll get another email from someone!



OMG! OMG!

Inspirational site of the month: Vesper. OMG please ... Inspirational should mean just that or have they redefined the word inspirational as lazy, awkward, bland. Don't get me wrong it's not the worst site I've seen, but inspirational it's not. Whiting out images for alignment purposes. Heading creeping under images when viewed on smaller devices (KindleHD Silk). The oversized buttons when viewed on laptop. The clunky sunset sunrise section. Plus OMG I actually wrote OMG and three times I must be pis*%d.

Doug Ferron, UK

Err ... OK. Doug doesn't seem to agree with Chris Allwood's choice for the Site of the Month in the Gallery of issue 263, *vesperhotel.com*, as designed by Digital Natives. Of course it's very subjective – but also remember the golden rule: once intoxicated, step away from social media and email!



EXPRESSION ENGINE

I'm a regular reader of your magazine and often find the features and projects you

publish of great use. Do you have any plans on featuring ExpressionEngine as a CMS project or feature? I have seen regular features on WordPress and was wondering whether EE was a possible option too? There are plenty of areas that could be covered, such as DRY templating using its native layout tags, or Mark Croxton's Stash? Or maybe their extensive add-ons and extension library.

Just a thought, it's such a powerful CMS with a great community, and would be great to feature.

Scott Harrington, Essex, UK
Good point, Scott! You're right, we haven't covered ExpressionEngine (netm.ag/pression-265) in a while.

The rebranding of the ExpressionEngine podcast and the disappearance of various events dedicated to ExpressionEngine seems to suggest it's not as popular as it was maybe three or four years ago. What do other readers think? Would you be interested in reading more ExpressionEngine tutorials? Let us know.

CORRECTION

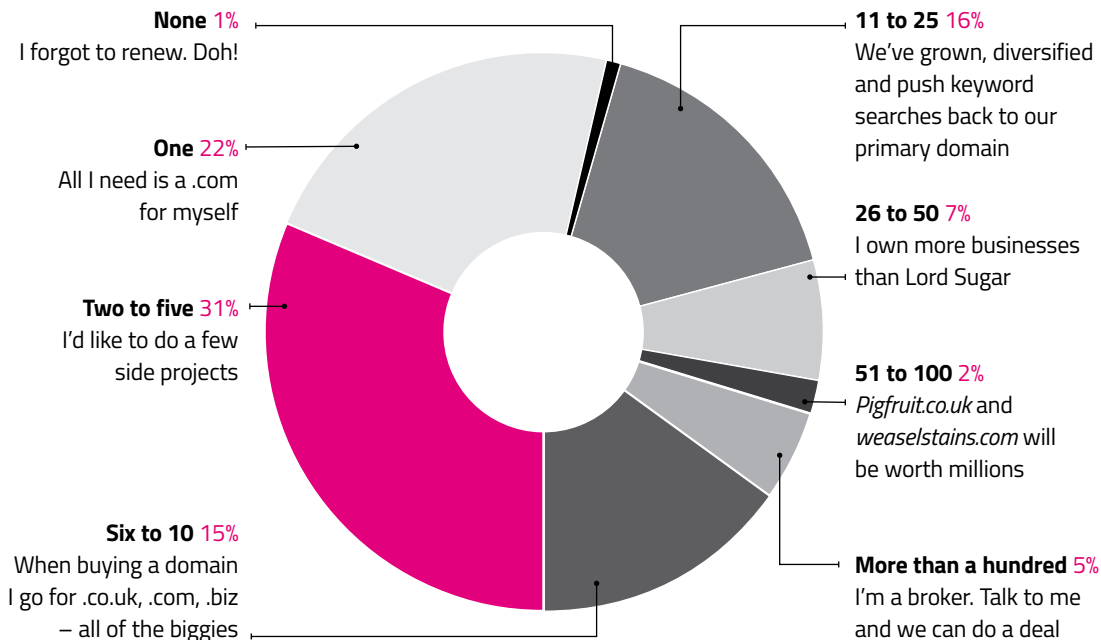
In our cover feature on the 'Top 10 web design tools for 2015' in the February issue (263), we inadvertently mixed up the screenshots for Affinity Designer and Marvel. Apologies to both companies! We blame the Christmas rush and too much mulled wine.



Blast from the past Liran Tadmor found this 1995 issue of .net (complete with Andy Warhol as our surprising cover star) on a park bench in Tel Aviv

*THE POLL

HOW MANY DOMAIN NAMES DO YOU OWN?



From our timeline

What's the most interesting domain you own, and what are you hoping to do with it?



I bought *shitpubs.co.uk* a couple of years ago. No idea why.

@SteveGrant1983



I have *websnacks.co.uk* – still don't know what to do with it!

@plastic_fuzz



isbawsaonlineyet.com. I haven't even been bothered enough to put a simple "NO!" page together!

@martinbean



Still haven't made my meat preference dating site with

wouldliketomeat.com

@ChrisYaxley



inspirationaldigital.co.uk – it had a nice ring to it so we snapped it up!

@oomagnitude



uselesswoodentoy.com. Build a skateboarding site mecca

@DevelopSean



I own *www.baconkitty.co.uk*. It's actually a HTML5, CSS3 and

jQuery side project I've been working on for far too long now!

@mwdesigner



I never could get it, but I wanted to buy *wickedcards.com*. An e-card service for inappropriate occasions (e.g. colonoscopies).

@egandalf



I owned *ispiersmorganatwat.com*. The answer was always yes.

@stevebalderson

COOL STUFF WE LEARNED THIS MONTH

MICROSOFT SPARTAN

+ When Google built a browser it named it Chrome, after that decorative guff on cars. Now Microsoft is following suit. It is hoping to deliver a sparse and streamlined affair, and so has dubbed its new window on the web Spartan. Under the tunic, Spartan promises a whole new render engine. netm.ag/spartan-265

LEARN BY WATCHING

+ We tend to think that learning new things should require lots of blood, sweat and tears. However, freelance designer and developer Tom Kenny reckons we can learn a lot by simply watching the experts. Here, he reasons through how the brain works and offers tips on how to observe more keenly. netm.ag/inspect-265

NAIL PUBLIC SPEAKING

+ Public speaking is about as much fun as receiving root canal surgery from a hungover Berserker, on a rollercoaster. As such the web is groaning with tips for conquering your fears. This particular 'All-purpose guide' is fantastically well written; a must-read for anybody tempted to hit the conference circuit. netm.ag/speak-265

EXCHANGE

Send your questions to netmag@futurenet.com

Practical
advice from
industry experts

THIS MONTH FEATURING...

SARA SOUEIDAN



Sara is a frontend developer, writer and speaker from Lebanon
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t: @SaraSoueidan

JASON LENGSTORF



Designer and developer Jason is spending 2015 traveling through Europe
w: lengstorf.com
t: @jlengstorf

LARA HOGAN



Lara is the senior engineering manager of performance at Etsy
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LUCASZ ZELENY

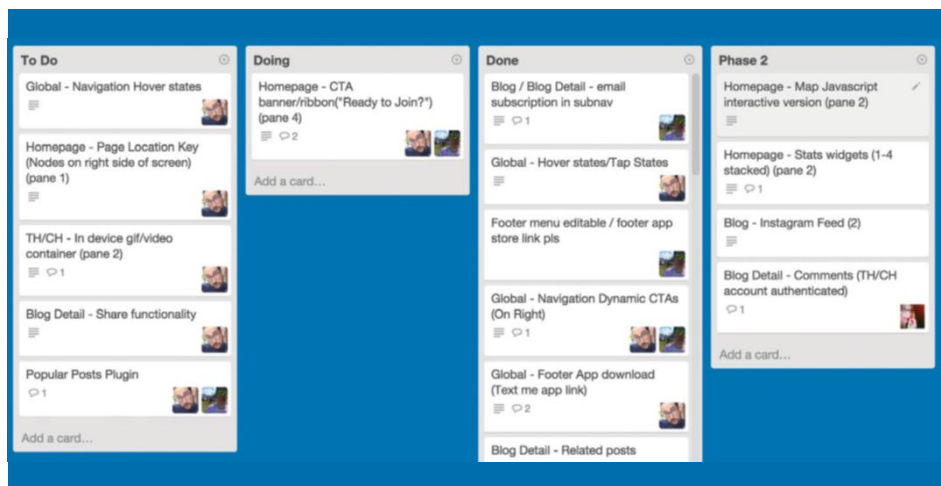


Lukasz is the head of organic acquisition at uSwitch.com
w: uswitch.com
t: @LukaszZeleznny

★ QUESTION OF THE MONTH

What are your tips for workflow across distributed teams?

Madeleine White, Staunton, UK



Distributed teams Tools like Trello (above) can help promote clear and effective communication

JL: In distributed teams, the need for well-defined expectations cannot be overstated. Every step left open to interpretation is a potential point of failure. For every project, write a thorough scope with clear deliverables – if there's anything on the list without a clear 'yes' or 'no' answer to determine if it's finished, the scope needs further clarification. Create concrete processes (and documentation) for any repeatable tasks. Choose tools the team will actually use – I recommend Trello (trello.com) and Slack (slackhq.com). Most important of all, trust your team to do the job they've been given.

SVG

CANVAS QUESTIONS

SVG or HTML5 Canvas?

Simon Nolan, Manchester, UK

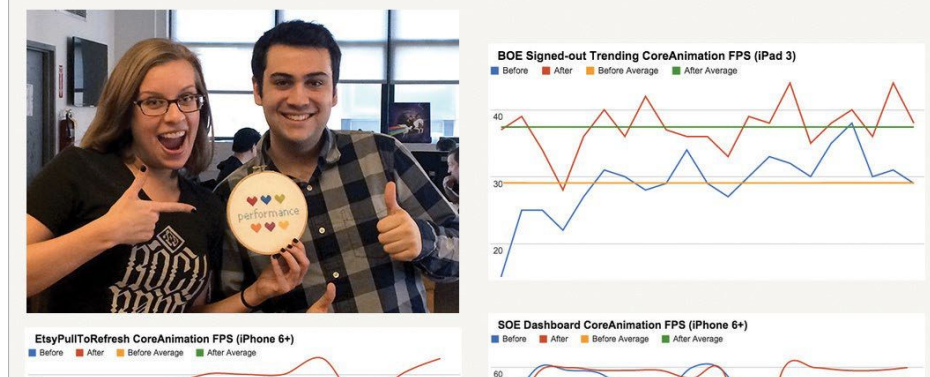
SS: It depends on what you are working on. SVG has many advantages over HTML5 Canvas – the most important being that SVG content is accessible, while Canvas content is not. Moreover,

animating SVGs with CSS, SMIL or JS is easier than animating Canvas – the latter requires that you draw every single frame using JavaScript, while SVG can additionally be animated using declarative syntax (CSS or SMIL).

SVG has an accessible DOM API, many authoring and optimisation tools, and – of course – is scalable. These advantages

Mike MacDougall - Performance Hero

Mike found many opportunities to reduce scroll junk in the apps, including removing blending backgrounds and using rasterization.



Incentives The team at Etsy has a 'Performance Hero' award to celebrate great site improvements

make SVG the better choice for things like infographics, for example, and web app user interfaces. HTML5 Canvas is a great choice for creating interactive and dynamic bitmap images, generating and exporting raster graphics, editing images, and operations that require pixel-based control.

PERFORMANCE

BUY-IN INCENTIVES

What's your advice on incentivising buy-in of web performance through gamification in a team environment?

Kevin Lozandier, California, US

LH: We celebrate performance wins from other development teams at Etsy. We have a wall monitor dedicated to celebrating a 'Performance Hero' – someone who has found a great performance improvement on their product or feature and improved the site substantially. We update this and dole out lots of high fives whenever there's a big new win; people respond really well to the positivity and encouragement. We've found that when people see it, they're reminded to look for their own performance wins.

SEO

PR SECRETS

Do you think SEO and PR are coming a lot closer together, with great PR leading to better rankings?

James Bavington, Rugby, UK

LZ: During the last few years, it's been clear that PR and SEO are playing on the

same team. It's kind of a trend now. You can see the same with SEO and social media, for example. When PR is really focused on high quality content, we SEOs may help with nuances like search volume, optimisation and seasonal demand fluctuation. All of that helps PR content to rank better and that's why, whenever possible, PR and SEO should work closely together.

WORKFLOW

SILVER BULLETS

Do you think agile is the silver bullet for all workflow problems?

Bailey Bradley, Sheffield, UK

JL: Unfortunately, there's no such thing as a silver bullet. I've seen agile teams implode, and waterfall teams run like well-oiled machines. The trick is to find an approach that everyone in your organisation is willing to follow, then follow it religiously. This is doubly important for management! If the process isn't followed, it's completely useless. But when everyone works together and plays by the same rules, teams tend to function wonderfully.

SEO

ON THE WAY OUT

Will SEO become obsolete?

Phil Ward, Adelaide, AU

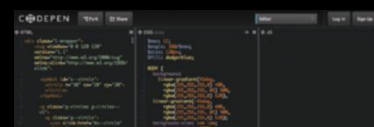
LZ: SEO is at the root of search engines so the concept of it will remain the same. Imagine how a search engine would look without organic results – it would just be a classifieds website. A few years

3 SIMPLE STEPS

Should we use CSS, JS or SMIL for animations?

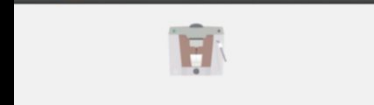
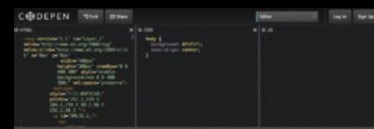
Jack Hawkings, Rome, IT

SS: CSS, SMIL and JavaScript each have pros and cons. Weigh them up with your needs to make a decision [For an extended answer, visit netm.ag/SS-265]



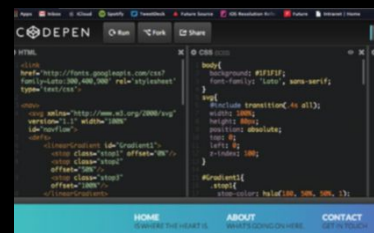
CSS FOR TRANSFORMATIONS

+ CSS is often great for animations. CSS animations on SVGs perform better on mobile than SMIL animations. However, not all SVG properties can be animated via CSS.



SMIL ISN'T FUTURE-PROOF

+ The advantage to SMIL animations over JS animations is that they are preserved when the SVG is embedded as an image. However, SMIL will be deprecated in favour of the Web Animations API.



JS OFFERS CREATIVE FREEDOM

+ JS makes animating easier if you use one of many available SVG animation libraries, and gives you finer control over timing functions and easing.

- ago, people were freaking out about voice recognition search, saying it would kill SEO and the way we used to use search engines. The only place I see people using voice recognition is on commercials trying to sell voice recognition. Long live SEO!

PERFORMANCE

RETINA RESOLUTION

Are double-res images worth their weight? Especially if traffic to your site is under 6 per cent retina?

Andy Layman, Seattle, US

LH: Using the new picture spec, you're able to deliver correctly-sized images (including retina) to the right devices, which is a huge performance win as it reduces unnecessary overhead. The question is really: is the development time needed to optimise and deliver those images worth it, if your traffic is under 6 per cent retina? Weigh the development investment against the engagement metric gains from delivering more beautiful images.

SVG

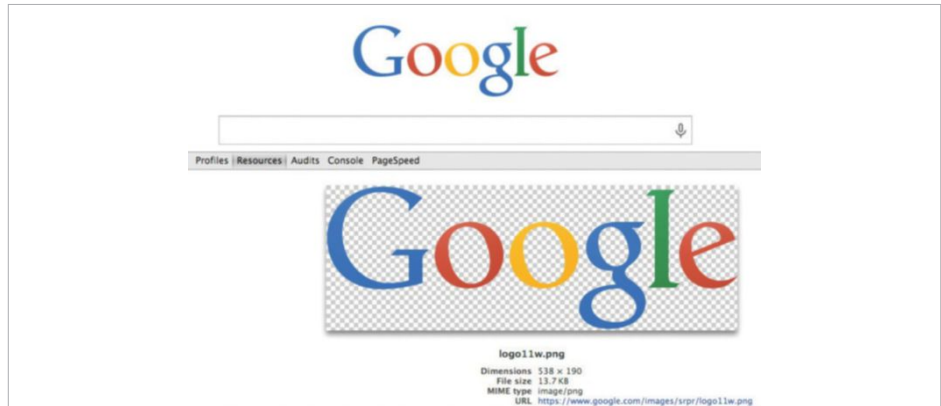
CLEANED UP

I'd love to know best SVG 'cleaning up' practices – Illustrator and Sketch leave bloat.

James Rosen, San Francisco, US

SS: Editors do generate a lot of bloat and unnecessary code that you can (read: should) remove before using your SVG. Cleaning up SVG code is recommended whether you are going to dig into the code and style/animate/script the SVG, or you are going to just use the SVG as a static image on your website. The most popular SVG optimisation tool is SVGO (github.com/svg/svgo). SVGO comes with many tools that you can fit into almost any workflow – like Grunt and Gulp plugins, OS X folder actions and GUIs.

Note that optimising an SVG using SVGO could change the SVG document structure and might eventually affect any scripting and animations you have applied, so choose your optimisations wisely. If you are only going to use the SVG as a static image, you won't have anything to worry about – just make sure the SVG `viewBox` is preserved.



Retina resolution Here the size at which the Google logo is displayed is smaller than the size of the logo file

SEO

SITEMAP SHARING

Sitemap submission – yes or no?

Jordan Foord, Sydney, AU

LZ: There is a big ongoing debate about the pros and cons, and dos and don'ts relating to sitemaps. My answer is – it doesn't cost anything to generate one (especially if you use *XML-Sitemaps.com* or similar), but it may help your site to have one. Remember about the HTML version too, as a part of your website.

PERFORMANCE

HACK HANGOVER

Will there be a hangover from all our performance 'hacks' once HTTP/2 and SPDY is rolled out?

Justin Avery, London, UK

LH: Yes! I wish we could say that one day we will be in HTTP/1 land, and a switch will be flipped, and the next day we'll be in HTTP/2 land. Unfortunately, there will be a long time in which we have to plan for a mix of the two. We'll have to continue to do things like concatenate assets for a while. As we creep closer to more support, check out: *caniuse.com/#feat=spdy* for specific cases.

SVG

SCALE AND ROTATE

What is the best option for scaling and rotating SVG elements in a group through JS? On the group or each element?

Leif Ringstad, Copenhagen, DK

SS: For JS, SMIL or CSS animations, it depends on whether you want to preserve the spatial relationships of the elements within the group. If you want to preserve

them, transform the entire group. If you only need to transform one element in the group, then do just that.

SEO

SUBDOMAINS

Are subdomains bad practice for SEO?

Lallo Vigil, Colorado, US

LZ: It's more about website architecture than SEO. Take a look at Wikipedia or HubPages. Wikipedia places each language version on a subdomain, while HubPages – a blogging platform – places each user on a subdomain. If any user starts linking to their own blogposts against Google's TOS, a manual action will likely be placed on a specific subdomain rather than the whole site.

WORKFLOW

EMAIL TIMESAVERS

Is there a way to automate some of the emails I have to write for every project?

Louis Castaldo, Florida, US

JL: Absolutely! For personal use, try TextExpander for Mac (netm.ag/text-265) or PhraseExpress for Windows (phraseexpress.com). With these you can create abbreviations for your frequently used snippets of text. For example, when I type 'callme' it auto-expands to my hours and contact info. If you're working on a team, tools like Zendesk have 'macros', which are like TextExpander snippets with added functionality. Both tools allow for variable input where you can insert the client's name or other info that changes in each message. Give these a try – it should save you thousands of keystrokes a day! 📧

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> The conference for web designers, presented by net and Creative Bloq, is back! Here's why you need to be there.

01 ENJOY AN OUTSTANDING SPEAKER LINE-UP
We've put together a stellar bunch of people for this event. See netm.ag/speakersNYC.

02 PICK 'N' MIX
There are two tracks, so you can choose the talks most relevant to your job and interests.

03 DISCOVER TOMORROW'S TRENDS TODAY
Come along and learn the principles you need to stay ahead of the curve.

04 ATTEND SHOPIFY'S INTERACTIVE WORKSHOP
Get an overview of the Shopify platform in this 30-minute session

05 SUPERB NETWORKING OPPORTUNITIES
Make contact and share ideas with fellow web folk in a fun, energised environment.

06 SAVOUR AN AMAZING LOCATION
Generate will take place at the New World Stages, just off Broadway.

07 HANG OUT WITH THE SPEAKERS
Why not share a beer with the speakers and the Generate team the night before the show?

08 PARTY THE NIGHT AWAY
When the talks are over, make sure you don't miss our after-party.

09 MAKE A TRIP OF IT
There are tons of other great things on around the same time, like the Tribeca Film Festival.

10 EXCLUSIVE GENERATE VIDEOS
Afterwards, you'll get exclusive online access to all the talks you may have missed.

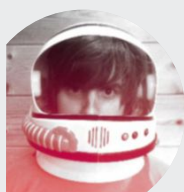
11 DID WE MENTION LUNCH?
Finally, if you still need persuading, here's a final clincher – the lunch will be fantastic!



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generateconf.com/new-york-2015

FEED

People, projects
& paraphernalia

THIS MONTH FEATURING...



SIDE PROJECT OF THE MONTH 16

David Gillett shares what he's learnt in his photography project 12 by 12 – now in its third year, and still going strong



CLIENTS FROM HELL 17

A designer wrangles with a clingy customer who doesn't understand the concept of a terminated contract



WORKSPACE 18

Lahaina Mae Mondoñedo gives a whirlwind tour of nclud's workspace, which comes complete with its own enviable bar area



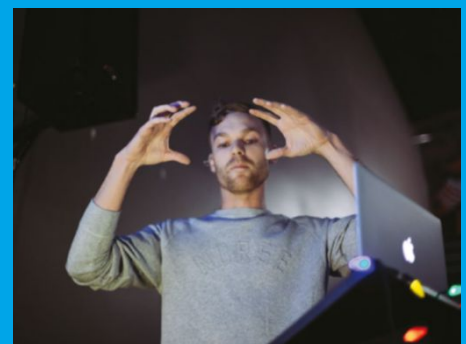
BEYOND PIXELS 20

Randall Bohannon gives an insight into the patience, precision and practice that goes into building model ships from scratch



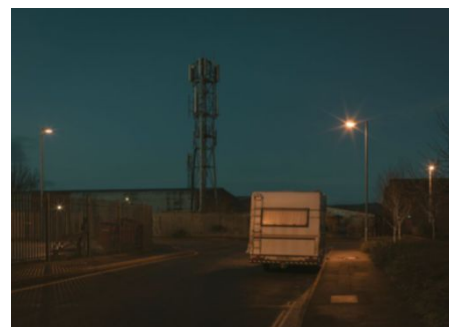
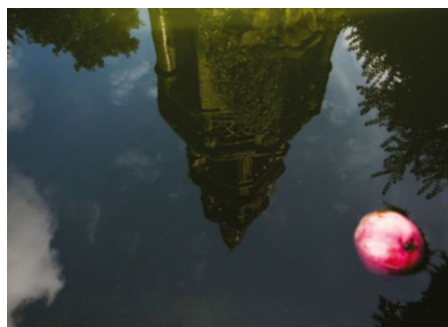
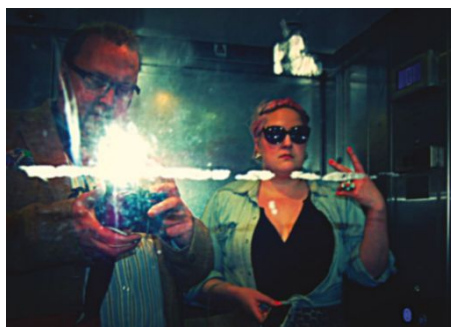
NEED LIST 21

A look at the objects of web design desire we're lusting after this month, including a dinky guide to Git from Ryan Taylor



EVENT REPORT 23

CSSConf Oakland is a web conference with a comfy vibe – right down to the squashy armchairs. **Natalie Downe** was there



12 BY 12

Digital designer **David Gillett** is embarking on the third year of his inspirational photography project

★ SIDE PROJECT OF THE MONTH



job: Digital designer

w: davidgillett.co.uk

t: @davidsamgillett

> net: How did you get involved in photography?

DG: Although I get a great deal of satisfaction from being a freelance designer, I started to feel as though I wasn't building new skills. Photography seemed like a natural fit for me. I attended a few courses and took part in a number of photographic projects but never really felt as though I was being challenged. I decided to set up 52 by 52 and create the photo project I'd been looking for myself!

52 by 52 was a year-long series of photo challenges set by renowned photographers. Every week a new challenge was issued and group members were invited to interpret it by submitting a photo to a Flickr Group. To my surprise, it ended up attracting some of the world's leading contemporary photographers and we built up a lively, passionate online community. After 12 months of running the project I changed the format to become 26 by 26, and then for the third year, 12 by 12 (12by12.net).


net: How is 12 by 12 different?

DG: The concept remains the same, but year three features monthly challenges. It will be interesting to see how a longer time frame alters the members' responses. 12 by 12 also encourages experimentation in terms of approach as well as aesthetics.

net: Do you have any favourites amongst the photographers who have been involved?

DG: One of my all-time favourites came from Martin Parr (martinparr.com) in year one. His challenge was: "Photograph something that you have never shot before, in a style you have never used before, so the photo is not recognisable as yours." It seems to get to the root of what the project is about: straying far from one's own comfort zone. I think part of the reason 52 by 52 was so successful in attracting such high profile photographers was the fact it was mutually beneficial.

net: Any tips for designers planning to embark on a new side project?

DG: Invite other people to collaborate with you as soon as possible. It's easy to hold on too tightly to your side projects, strangling them with your own sense of perfection. I found opening the project to other people's input made it feel like it was much bigger than just my own 'baby'. 



* HOW TO

MAKE THE MOST OF A/B TESTING

Can't decide what's right for your site? We asked our Twitter followers about the perils and pitfalls of A/B testing

OPT IN OR OPT OUT

@garethllew has a double-pronged approach: "Research with Mouseflow and test with Optimizely." @mattpointblank, however, cites a cautionary blog post from @sumall about not using Optimizely correctly: "Read this before getting too excited when your results show what you want them to show: netm.ag/optimizely-265."

AS EASY AS ABC++

@osvik highlights Google's typically experimental approach to testing: "I use Google Analytics for content experiments without redirects: netm.ag/analytics-265." @halfnibble, meanwhile, goes back to basics: "I always use C++ to test both A and B – it is so much better than C."

FACE THE FACTS

@bluemwhitew employs a little-known piece of WordPress magic to test his sites. "I use 'get_template_part' to include recyclable and/or split-testable template components" (netm.ag/temp-265). Finally, @_LeonBrown keeps things old school: "Don't forget to test with users face to face and ask them questions."



CLINGY CUSTOMER

Exclusively for net: the latest in a series of anonymous accounts of nightmare clients

* CLIENTS FROM HELL

I worked with one particular client for several years. Eventually, he stopped paying me in a timely manner, and had to let him know I would no longer be working with him.

However, he continued to email me for design work, repeatedly mentioning a big event one weekend. In my replies, I reminded him of our contract's termination. Then, the night before his event, I got a text.

Client: We okay? Thanks.

The next text came minutes before midnight.

Client: Everything okay for the logos?

Me: No – our contract is over.

Client: I know, but you told me you would handle my needs through to the end of July.

Me: It's August.

Client: We have worked together for a long time. Please help me with the logos I need, and then later we can close things out properly.

Me: We have nothing to close out – our contract terminated at the end of July, and you have only paid up to March.

Client: But every time you asked me to pay you, I brought a cheque to you!

Me: That is not true.

Client: Please don't screw me and my customers. Just help me out with these logos.

Me: I do not appreciate you hounding me at this hour. I am already in bed. Please do not contact me again.

Client: But I have been texting you all week!

I did not respond. In the week that followed ...

Client: Do you know anyone who can help me with my website?

The next day ...

Client: Can you refer me to another web designer? And did you do those two logos I asked you to do?

Two days later ...

Client: Call me. I am trying to make the logos myself and I need help with Photobook.

I assume he meant Photoshop. Needless to say, I didn't reply.

CLIENTS FROM HELL
clientsfromhell.net



BUILDING BLOCKS

Lahaina Mae Mondoñedo shows us around nclud's studio, where every visitor contributes to the décor

* WORKSPACE

➤ nclud is a creative agency that lives at the convergence of design and technology. Our company consists of designers, developers and strategists, and our studio is central to our work and culture. At nclud, we're habitual challengers of the status quo, and our workspace is no exception.

Designed by our creative team in partnership with a world-class architectural firm, our space allows ideas and talent to flourish, while ultimately providing our clients with innovative solutions.

We like to surround ourselves with the work and designs of our friends and colleagues in the global community. In fact, we

keep a token from every industry speaker or visitor to our studio – including this space shuttle illustration by Aaron Draplin (1).

Lego bricks (2) are the team's favourite toy. We often use them to explain ideas and make topics more tangible. Our approach can make people nervous, but we find using these familiar objects in unconventional ways helps us better collaborate with our clients.

Our process at nclud integrates team members across different disciplines, from project start to finish. The space is filled with sketchbooks (3), whiteboard walls, blackboard walls and writable glass walls, so every part of our office is

an area where ideation between any team members can occur at the moment of creative bliss and without barriers.

As a digital agency, we believe in creating within the medium that we're designing for as soon as possible. We advocate the idea that code and design should drive each other, right from an idea's inception. We're constantly mocking up concepts on laptops (4) and TV screens throughout the day.

Finally, one of the busiest areas in the studio is our 'bar' (5). Whether it's for team standup meetings, design critiques or brainstorming over burritos, this space keeps us active and on our feet. Much like the entire office, this setup breaks down barriers to collaboration and gets everybody in the conversation. **■**

* PROFILE

Lahaina (@lahainamae) is a senior strategist at nclud (nclud.com). She specialises in producing multimedia content and marketing campaigns



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STUFF I LIKE

**JEN SIMMONS**Host, *The Web Ahead*
theweahead.net**GIT TOWER**

When prototyping, everyone should be using Git version control to prevent loss. Tower makes understanding and using Git much easier, and I love staying in a visual frame of mind while designing, not switching to the command line.
git-tower.com

CODEKIT

I use Sass on most projects, but running the Ruby command from the command line makes my Mac too slow. Plus, if I do it all manually, it's a lot of steps. CodeKit handles everything. It makes preprocessing idiot-proof.
incident57.com/codekit

PANTHEON

Pantheon is not really a hosting space, it's more of a deployment and management app. Every project has dev, test and live 'servers'. It comes with Memcached and Varnish to make sites wicked-fast. It's got Solr search. Why would I want to set all that up myself? Pantheon already has everything done right.
getpantheon.com



MODEL SHIP BUILDING

This month ... patience, practice and precision helped **Randall Bohannon** master this time-consuming art

★ BEYOND PIXELS

> One afternoon, I had gone to see a touring exhibition about the Whydah Gally, a ship that was used for privateering – a pirate ship, if you will. On display was a beautiful model of the actual ship, and I was in awe.

My love for model ship building was born. At first, it was just a cool thing to do, but as I started building my first ship, admiration for the master shipwrights that designed and built these magnificent vessels replaced the cool factor.

I love my gadgets, but there comes a time when you need to power down and think for yourself. It is that complete separation from the digital world that is so refreshing. I am not the best model shipwright by far, but I get great satisfaction when major build milestones are complete. Model ship building is like nothing I have ever done before. It takes extreme patience, practice and precision.

This has been my hobby for almost four years now, and I have yet to complete my first scratch-built ship – the HMS Triton, a British, 28-gun, modified Mermaid class frigate from 1773. During my build, I go into extreme detail. I even make the bolts that were used to fasten pieces together, and if they're available, I use the same materials that were used on the actual vessel.

One big connection to web development and design is to do with problem-solving. I force

myself to think for myself, without pulling up Google. I want to learn, not be told how to do something. I bring that focus into my web work and notice that ideas flow much more freely.

The keel of a ship is the most important structure – it's the 'backbone of the ship'. Everything was built and measured from the keel upwards, and measured in terms of length, depth and width of keel. Bolt sizes were custom-made from fractions of depth of keel; hull planks, frame widths and height, gun count and so on. The keel wasn't just the backbone, but the heart of the ship.

This permeation throughout the entire construction process kept everything in proper proportion and balance. The ability to visualise a complete process and an end result was invaluable to shipwrights, and seems a little lacking in our profession. Under all the requests and requirements, there is a keel, one single structure, goal – the soul of your project. Find it, and you have your entire venture laid out right before your eyes. ■

★ PROFILE



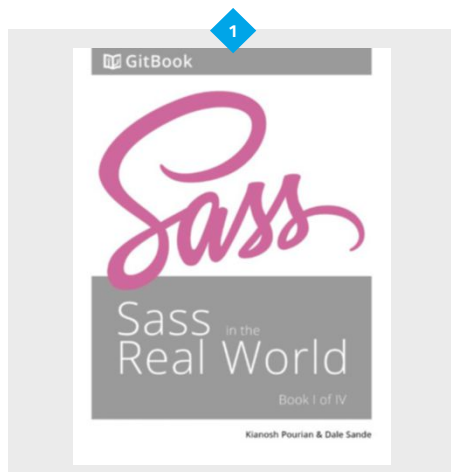
Web designer and developer Randall is an Air Force veteran and the founder of Triton Web Arts (tritonwebarts.com)



★ NEED LIST

STUFF WE WANT

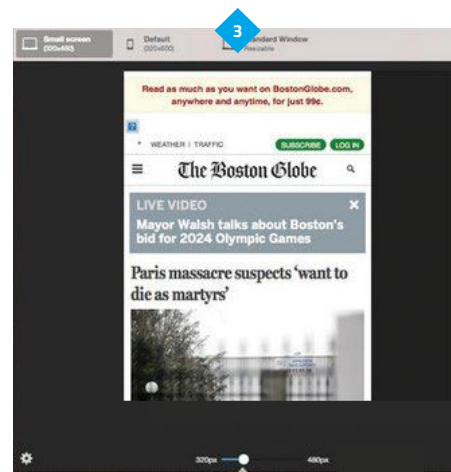
Small objects of web design desire: from an app that enables you to act as eyes for a blind person to a handy pocket guide to Git



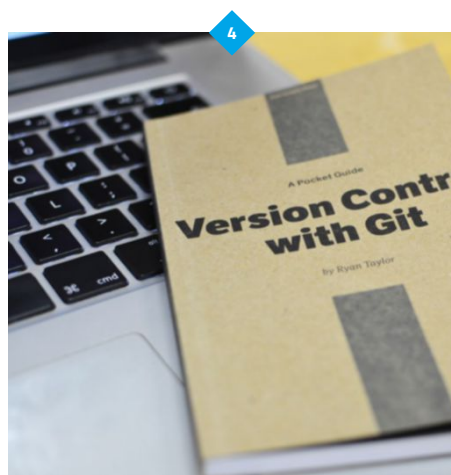
SASS IN THE REAL WORLD (BOOK 1) \$13



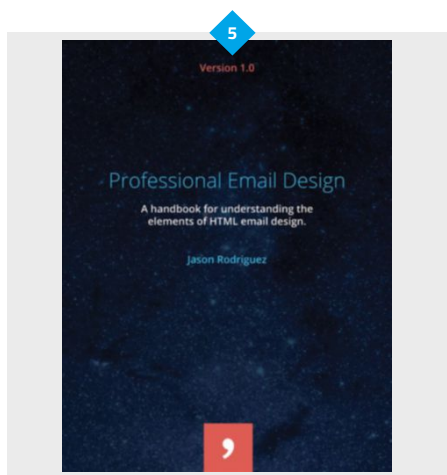
GET STARTED IN UX \$18



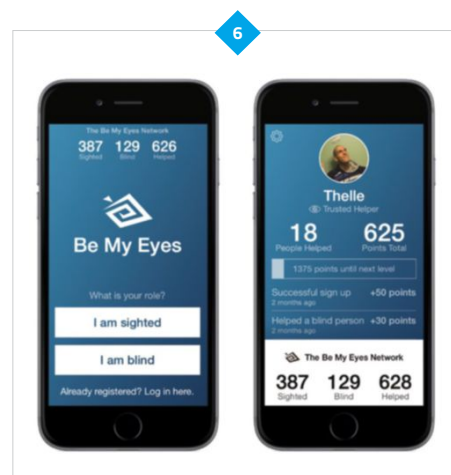
VIEWPORT \$4.99



VERSION CONTROL WITH GIT £3



PROFESSIONAL EMAIL DESIGN \$29+



BE MY EYES FREE

What we think

- (1) This four-part book series tackles the A-Z of Sass development, from starting out to getting really Sassy (netm.ag/sass-265).
- (2) Want to know which UX course to study or how to get a UX job? This book helps you master all things UX (netm.ag/master-265).
- (3) Looking for a new way to test your responsive websites? Viewport is the latest browser to enable you to do just that (netm.ag/viewport-265).
- (4) In this Five Simple Steps pocket guide, Ryan Taylor introduces Git and explains how it will revolutionise your workflow (netm.ag/git-265).
- (5) Email can be surprisingly difficult. Jason Rodríguez has created this guide to the components of HTML email design to help you on your way (professionalemaildesign.com).
- (6) Be My Eyes uses live video chat to connect blind people with volunteer helpers all over the world (bemeyes.org).

**NEXT
MONTH**

THE MONEY ISSUE

We reveal how much you should charge, how to create amazing ecommerce sites, and much more!

PLUS

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EVENT GUIDE

HTML5 DAYS

DATE: 4-6 MARCH 2015

LOCATION: MUNICH, DE

Get to grips with HTML5 over three days with this intense series of workshops. It runs concurrently with JavaScript Days and Angular JS Days, so there's plenty to choose from if you're already a markup master.

html5-days.de

MINNEWEBCON 2015

DATE: 13-14 APRIL 2015

LOCATION: MINNEAPOLIS, US

The City of Lakes hosts this grassroots web conference for the eighth year running. Karen McGrane and Steve Krug will provide the keynotes, while more than 20 sessions will take place with various design gurus.

minnewebcon.org

HOW DESIGN LIVE 2015

DATE: 4-8 MAY 2015

LOCATION: CHICAGO, US

This five-day event includes masses of talks on all things web-related, as well as talks on infographics, brainstorming and leadership skills. The first two days are designed specifically for 'solopreneurs', so if you're going it alone this is the conference to attend.

howtodesignlive.com

UPFRONT

DATE: 19 MAY 2015

LOCATION: MANCHESTER, UK

The Comedy Store in Manchester hosts this forum for everything frontend. Experts Brad Frost and Alicia Sedlock will be crossing the pond to present talks, while Richard Rutter will bring British sensibilities to the event.

upfrontconf.com

CSSCONF OAKLAND

Natalie Downe reports from the California web conference with a comfy vibe

★ EVENT REPORT

DATE: 9 DEC 2014

LOCATION: OAKLAND, CA

URL: cssconfoakland.com

The inaugural CSSConf Oakland took place at The New Parkway Theater in December. It was expertly coordinated by Mikeal Rogers, Karolina Szczur, Kristina Schneider and Alex Sexton as part of JSFest, a week-long series of frontend events in Oakland, California.

The relaxed setting meant it felt like chilling in the tatty sofas of a cosy living room, hanging out with 100 or so close personal friends. The sessions were excellently curated to form a well-rounded agenda, with healthy diversity in the line-up and women representing seven out of 12 speakers.

Tab Atkins of the CSS working group (xanthir.com) spoke with such bubbling enthusiasm for new capabilities coming to CSS that we couldn't help but be carried on a journey to the glittering future. A future where an image can be the output of a function, you can create source-order independent layouts with Flexbox and even programmatically adjust colour values live in the core language. Even media queries are getting a facelift with the ability to target the accuracy of the pointer, or if a device has hover capabilities.

Two other highlights were talks borne of experience gleaned through hard graft on real-world projects. Jessica Dillon (netm.ag/dillon-265) told the story of the implementation of Bugsnap, a visual CSS testing framework, while Jennifer Wong (jennz0r.github.io/1999) shared lessons learned in her quest for beautiful responsive emails. Both talks elegantly encapsulated their respective projects and provided the audience with valuable take-home lessons.

Unequivocally my favourite session came from Elyse Holladay (pictured above), a frontend architect at RetailMeNot, whose eloquent and raw talk spoke directly to the soul of everyone there (netm.ag/holladay-265). Holladay mused that as we gain experience and are no longer safely coddled in the confidence of inexperience, we panic about what we know we don't yet know. She proposes that instead of agonising over not yet being good at something, we be kind to ourselves, relish the challenge of learning and stay curious. **A**

★ PROFILE



Natalie is the director of frontend engineering at Eventbrite and co-founder of the professional events social directory lanyrd.com

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VOICES

Opinions, thoughts & advice



THE TRUTH ABOUT UX DESIGN 28

User experience isn't all about great interfaces.

Paul Boag thinks it's time UX designers took their place at the boardroom table



INTERVIEW 32

Generate speaker **Brad Frost** shares his thoughts on unnecessary redesigns, the big agency model and industry showboating



TECHNICAL DIRECTION 41

What exactly does a 'technical director' do?

Justin Jewett unpicks the job title and explores the qualities that make a great one

* CONTENT STRATEGY

GREAT CONTENT MANAGEMENT

Angus Edwardson takes a closer look at the emerging movement that's tackling the concept of 'content-first'

> The relatively new (or at least newly defined) role of 'content designer' throws up some interesting arguments when it comes to the 'content-first' approach to web design. A content designer creates content, much like a digital editor. However, their responsibilities extend to making decisions about the structure of the website and the presentation of content.

GOV.UK defines the process as "Designing content, not creating copy" (netm.ag/gov-265). Content designers are encouraged to think more like designers; being aware of design constraints, and thinking creatively about how they can meet user needs and business objectives.

Digging around marketing websites and blogs, you can see there is a fairly widespread shift in content professionals becoming more concerned with aesthetics, usability and functionality (netm.ag/con-

tent-265). So while the design community is screaming about needing to give more love to content, an almost inverse movement is happening on the other side of the fence.

Here, I'll outline a simple approach that can help us work together on website projects. The idea is to design sites that can be easily managed by content creators to consistently fulfil the aims of the project.

CONTENT TYPES OVER PAGES

Coming up with a set of well-defined content types is one of the best ways to unite content creators and designers from the start of a project. Content types might be things like Service pages, Staff bios, Product categories, Blog posts or Weekly emails [for more on content types from Angus Edwardson, see netm.ag/types-265].

Don't be concerned if you end up with nearly as many content types as you would have had 'pages' on your site. The idea is that they are more flexible than a list of pages. They are also more functional (the name of the content type has intention) and can be understood and referenced by everyone in the project.

By agreeing that the creation of any new content type is preceded by a proper review process, you can make sure your site's structure and strategy stays locked down. This means any new content has to fit into the existing taxonomy, or the creator must present a valid argument as to why the team should iterate the initial plan.

PROTO-CONTENT

An empty content type isn't enough to start designing a page. We need to get some real content in there in order to get an idea of what we're communicating. But while Lorem Ipsum obviously isn't going to cut it, we don't need to wait for days to get hold of a polished final draft, either. I suggest starting the process with some rough 'proto-content' (netm.ag/proto-265). You just have to be aware that the content will evolve with the design. This can be really healthy, as it challenges the design and technology around different instances of content.

CONTENT TEMPLATES

When it comes to producing the site's content at scale, you can use content types

While the design community is screaming out about giving more love to content, an almost inverse movement is happening on the other side of the fence

much like Erin Kissane proposes we use content templates: "Collect information more quickly by giving experts an easy fill-in-the-blanks structure to work with" (netm.ag/blanks-265). By translating all the elements in your content types into fields in a content template, authors can easily populate the structure with the appropriate content. By surrounding each field with rules and tone-of-voice guidelines, you can drastically improve the quality and consistency of the content supplied.

A FLUID SYSTEM

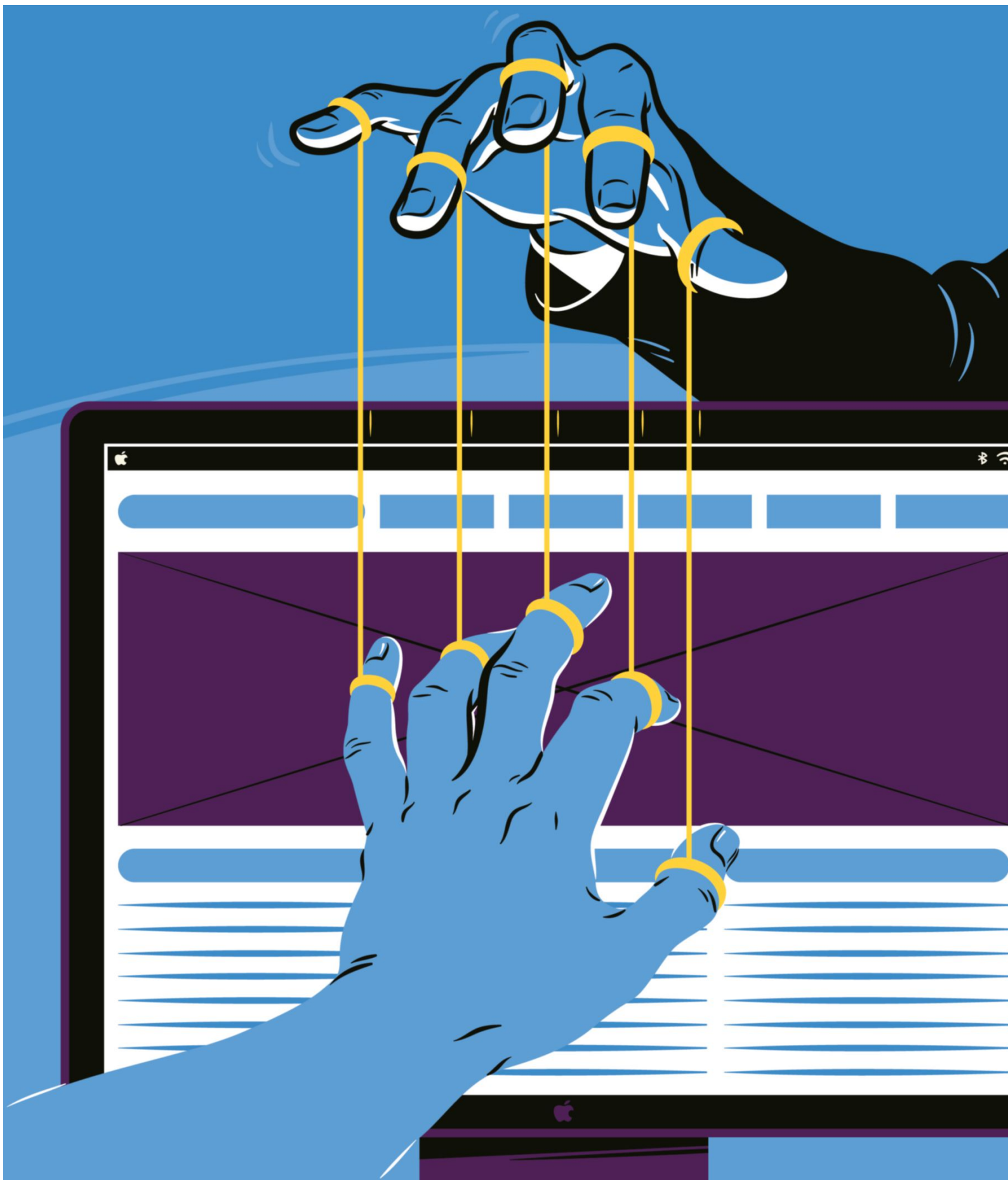
So, content design can be considered from two angles: it's a shift in how people are creating content, and it can also be a big influence on the way we design sites in the first place. We need our sites to be designed

for content creators. If your initial Content types are understood and referenced by everyone involved with defining, producing and publishing content, the whole process becomes much faster and more reliable. The content produced is always connected to the aims and intentions of the project.

Templates, guidelines and a workflow around content creation can really help to make ongoing development much easier. Content design is about knowing which channel, format or presentation technique is best – taking both design and the designers, as well as content and the content creators, into account. ■

Angus (@Namshee) is the product director at GatherContent, where he spends his time speaking to agencies and teams about content

* PROFILE



★ UX

THE TRUTH ABOUT UX DESIGN

Illustration by Ben Mounsey

You may have mastered slick interfaces – but if you want to really affect a user’s experience, get out of Photoshop and into the boardroom, says **Paul Boag**

➤ When you think about user experience design, what do you think of? A beautifully crafted interface? Sketching out a wireframe? Cracking open Photoshop or Sketch? In fact, user experience design starts not in Photoshop, but in the boardroom. If we want to call ourselves user experience designers then we need to expand our horizons.

Many of us like to call ourselves user experience designers, when in fact we are user interface designers. As soon as things beyond the interface come up we get uncomfortable. We claim that content is the client’s problem, or that we don’t have the authority to interfere in business processes. To become user experience designers we need to learn how to shape the entire experience, from beginning to end. That means moving beyond our comfort zone.

Take for example Uber. When Uber came to London it caused an uproar amongst cab drivers. The problem: Uber was able to offer a better user experience. Catching a London cab is far from a pleasant experience – they are over-priced, involve hailing a cab, having cash and waiting while the driver scribbles out a receipt.

Uber removed these pain points. It improved the user experience by estimating the cost, providing an updating ETA for the vehicle’s arrival, processing payment including tip, and sending a receipt via email. It didn’t improve things with just a nice user interface. Instead it addressed them by changing aspects of the business model, which involved executive decisions.

Parcel delivery is another sector seeing the power of UX design. For some time, delivery companies have had well-crafted websites that allow you to track your parcel’s progress. Unfortunately, the experience has been poor. Things are now changing. Companies like DPD are considering the whole experience – offering not only a well designed website, but one-hour delivery slots and real-time vehicle tracking.

Unfortunately a lot of management teams resist this kind of change, in much the same way the London cabbies have. The problem with resisting changes that improve the user experience is that they will fail in the end.

The music industry resisted downloads by suing Napster, but in doing so it only delayed the inevitable. In fact, sector after sector has fallen foul of improvements in the user experience brought about by digital. From Blockbuster to Kodak, big brands that failed to adapt have fallen by the wayside.

TIME TO FIGHT

This brings us as designers back to one of the most basic of human responses: fight or flight? Do we fight to improve the user experience across the organisations we work with, or do we fly to another organisation – one that understands the value of providing an outstanding user experience? Both options are valid, but if like me you are up for a good fight, read on.

It starts not only with the decision to fight, but also the decision that you are going to be the champion of

- ▶ the user experience. Nobody will give you permission, but as Grace Hopper said: It's better to ask forgiveness than permission. It means an end to saying 'I don't have the authority to change that'.

I realise that writing this is easy. Doing it is much harder – but it is possible. I have done it and so can you. I got sick of building sites that failed to live up to their potential because of organisational shortcomings, and I got tired of papering over the cracks with yet another redesign. One day I just decided to untie my hands and champion the user experience. When I started I was far from capable, but I learnt the skills I needed.

MAP THE USER EXPERIENCE

Fortunately the journey begins in more familiar territory: the user experience. To work out what needs fixing, you need to understand what the problems are. That means mapping the user journey. Look at every interaction a customer has with your organisation, from initial

Once you have mapped the user journey, you will be able to see weaknesses in the experience, and opportunities to use digital to improve things.

PERSUASIVE BUSINESS CASES

At this point you are probably thinking: 'I don't have the time to map the customer journey, and nobody would listen to my recommendations anyway.' This is where we need to start expanding our skillsets. We need to increase our understanding of business practices and improve our persuasive skills.

To improve the user experience you will need to put forward strong business cases. You will need to persuade management to allow you time to map the customer journey. Then you will have to ensure colleagues are willing to make changes to their business processes. This means improving our skills in two areas. We need to become more knowledgeable about business practices, and we need to refine our persuasive soft skills.

We need to stop complaining about marketers and business executives damaging the user experience. Instead we need to prove we can speak their language and help them solve their problems

awareness through to post-purchase support. For each touchpoint, you need to establish what the customer is thinking and feeling. What questions do they have at this stage? What do they want the outcome to be and how do they feel about the experience?

For example, imagine going to a concert by a band you love. A crucial part of that process is booking the ticket online. You know tickets will sell out fast and so you feel a mixture of excitement and nerves. Will you be able to book the tickets? Will you get the seats you want? Will the site stay up under the traffic about to hit it?

You might have questions about the seating options. If I go for a cheaper ticket will I have an obscured view? If a friend books his own tickets will we be able to sit together? Understanding what is going on in the user's mind at this touchpoint helps shape a better experience.

But don't just look at the digital touchpoints such as online ticket booking, look at the entire experience. As you are a digital professional, look for ways digital can improve offline interactions, too.

For example, perhaps the user's smartphone could hold the ticket, so they don't have to carry a paper ticket with them. Or perhaps after the concert they could access edited highlights online. This would provide them with professional-quality video that they could share with their friends.

We need to learn how to construct arguments based on threats or opportunities for a business. We need to discover how to use people's pain points to push through change. How to step outside of our web bubble and communicate effectively with business professionals.

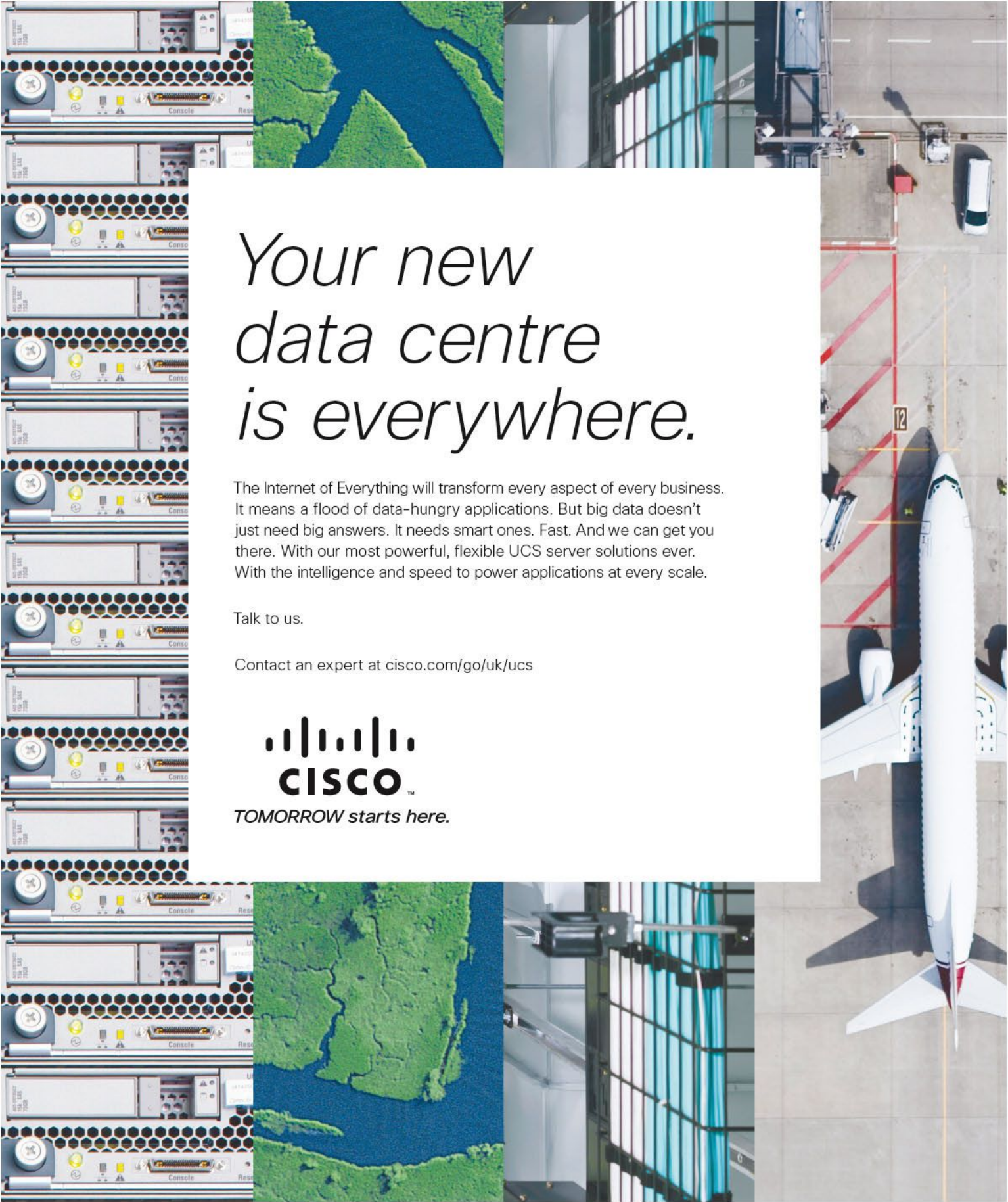
A single article like this is not adequate to teach you how to bring about organisational change, but there is no shortage of resources out there that will. If we are going to call ourselves user experience designers, we need to be reading about business strategy, sales theory and much more besides. Try books like *Good Strategy/Bad Strategy* (goodbadstrategy.com) by Richard Rumelt. Subscribe to Seth Godin's blog (sethgodin.typepad.com) or follow sites like inc.com and forbes.com.

We need to stop complaining about marketers and business executives damaging the user experience. Instead we need to prove we can speak their language and help them solve their problems. We need to step out of our silo and be willing to go wherever improving the user experience takes us. **n**

* PROFILE



Paul is a digital consultant, author and speaker who helps organisations such as the BBC, European Commission and Nestlé adapt to the new digital world (boagworld.com)



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INFO

job: Web designer

w: bradfrost.com

t: @brad_frost




BRAD FROST

Words by Martin Cooper **Photography by** Noah Purdy

The web designer and Generate speaker on cutting out showmanship, turning traditional publishing on its head, and why the big agency model is shifting





"Let your A-Team, your Navy SEALs set the pace. Don't shackle them. That's the most effective, most realistic way to get an entire organisation on-board. Just let them do their stuff. See if it works – and when it does, roll that success out across the whole organisation."

➤ Brad Frost is not a man for fancy job descriptions. "I'm a web designer, I leave it simply like that," he smiles. "I don't like getting too far into the weeds with titles." These days he specialises in helping clients move to a responsive way of working. This, he's keen to point out, isn't just about making web pages jump, morph and fold as the viewport changes size. That's the easy bit. Any web designer worth their salt, he reckons, can knock a responsive site together in a few days.

The difficult bit is what goes on behind the scenes. As such, these days Frost is more involved in helping companies adapt their workflows, sales, processes and structure so they can work responsively. Add that to his writing and speaking commitments, and he's a busy man. "I keep my dance card pretty full," he laughs.

FIRST DATES

Frost has established an impressive roster of big-name clients, including TechCrunch, Entertainment Weekly and Mastercard, to name a few. Happily, the industry has now got to the point where, at that all-important first meeting, Frost doesn't feel the need to explain responsive design any more. Many of his clients have already dipped their toes into the water and embraced the technology.

"The traditional model of contractors and agencies working with clients is an awkward dance," Frost says of the mechanics of that first meeting. "It's about impressing people and wowing them into hiring you. That's not how I think it should be."

Frost is emphatic that if you're a web design shop, this meeting should "go deeper than splashy pitches and showreels", and instead focus on having open and honest discussions.. It should be about facts, and taking the time to have an honest discussion.

Sadly though, he says, the desire to impress the client can sometimes get in the way of more important conversations. Those conversations should include, he says, discussing where the client feels they are now, and where they want to be.

So what kinds of things does Frost look to uncover? "Very often you have an idea about their goals," he says. "Maybe the client has a six-year-old website that's crusty and hard to maintain and, increasingly, they're seeing more numbers coming from mobile."



In such situations, having an objective outsider present can help bring clarity to the situation. “Those can be difficult conversations to have,” Frost explains, “and I feel like as an outsider I’m sometimes able to play the role of therapist, to get people to open up.”

NAILING DELIVERABLES

At this early stage, there also needs to be a discussion about deliverables. “You really need to set people’s expectations about what it means to build a site in 2015,” Frost says. “And that means talking through processes.”

One of the biggest challenges he faces is helping people understand that it’s OK to proceed without a high-fidelity image of what the final site will look like.

That leads to unrealistic expectations because, at the end of the day, a picture of a website isn’t a website.

Frost laughs: “Stephen Hay has a great line where he says, when you show a client a full comp, what you’re actually saying is: ‘Here’s a picture of what your website will never look like!’ And it’s entirely true.”

Once more, Frost returns to the temptation, when working with big agencies, to add and element of showmanship during these

early meetings. “I’ve seen people paint these dramatic, blue-sky comps and put them in front of a client with a grand Don Draper reveal. It’s like: ‘Wow! Aren’t you impressed?’ Sure, they might be impressed. But, at the end of the day, it’s dishonest to design things in that way. It’s not a smart idea to produce high-fidelity comps too early in the process.”

The reason being that the web is fluid. It has 100,000 viewport sizes and static comps don’t give a holistic impression of any proposed site. “This is something I’ve been talking about for a long time,” Frost continues. “Historically, we’ve equated design with aesthetics. Sure that’s important, obviously. Colour, typography, things like that – I’m not discounting them. But often, people paint a

very myopic picture of what the design actually is.”

What’s more, a static comp fails to represent critical considerations like performance and ergonomics – which have a huge impact on how users perceive a client’s brand.

MEETING CLIENT 2.0

The success – or failure – of the sign-off process, Frost maintains, can be traced back to those early client conversations. At that

stage it’s good practice to set expectations about how you intend to present incremental work. The key is to agree on an iterative, as opposed to a waterfall, approach.

The process, Frost says, “shouldn’t be based on call and response – ‘we present something to you, you react to it’. It’s meant to be a conversation.”

AGILE ASPIRATION

Surely though, clients who are fully conversant with the subtleties of responsive design are rare. Aren’t more traditional art directors hard-wired to ask for comps to sign off? According to Frost, these days clients tend to aspire to a more iterative, collaborative and agile way of working.

The reason is, partly, an economic one: it’s simply a waste of time burning huge numbers of deliverables. However, there are certain pressures on agencies that can mean they don’t always deliver that in practice.

“I’m working with a big client right now whose history is pretty entrenched in their catalogue,” Frost admits. “So, historically, their process has very much been: ‘Here’s a picture of the website, sign off on it, Mr Main Creative Director.’”

“Historically, big agencies have felt a lot of pressure to ‘prove’ themselves to clients, which can lead to those grandiose pitches and blue-sky design explorations,” he continues. “But in order to truly address

“I feel like as an outsider I’m sometimes able to play the role of therapist, to get people to open up”



- clients' needs, both clients and agencies need to evolve their processes to work more collaboratively and efficiently."

CALL FOR UNICORNS

So, what's Frost's idea of a perfect team and structure? "In an ideal world everyone is a unicorn," he quips. "They magically traverse between Ruby, Photoshop and PHP." In the real world, Frost says he's seeing a shift toward small teams that are doing incredibly good work.

"You have people like Paravel out of Austin, Cloud Four from Portland, yiibu from Scotland and Dan Mall's SuperFriendly in Philadelphia," Frost explains. "That's why I'm curious about the monolithic agency model. It doesn't require 1,000 people to make a 1,000 page website."

All you need, he says, is time and a small group of cross-disciplinary, 'T-shaped' crafts-people. And to make best use of them within a big organisation, Frost advises, you need to set them free on a pilot project.

"Let them – your A-Team, your Navy SEALs – set the pace. Don't shackle them," he says. "That's the most effective, most realistic way to get an entire organisation on-board. Just let them do their stuff. See if it works – and when it does, roll that success out across the whole organisation."

From a strategic point of view, Frost says the roll-out should be done by the client's own people. This approach ensures everyone

is on-board with the changes, and helps people feel invested in the new site.

ITERATION

There's another trend that's shaking up the way sites are being managed. Firms such as Airbnb, Amazon and Etsy are embracing small, data-driven, iterative changes. They may never again need redesigning because they're being constantly improved and refined. In Frost's opinion, the days of the blanket redesign may well be a thing of the past.

"Back to the big agency model: that's their bread and butter. 'So, you've got a crappy old Flash site? HTML5 is all the rage'.

And, in three years' time they come back and do it again."

He explains that some of the firms adopting a more iterative model are seeing huge commercial gains coming from small improvements. "I'm not saying companies shouldn't rebrand and move forward," he says. "People are just realising it's stupid to spend a million dollars on a redesign when they could be making subtle changes and seeing benefits."

Of course, there are times when a full-blown redesign is the only option. To help make things more straightforward, Frost

suggests thinking strategically and embracing pattern libraries. This way, the process will be much less painful because there's already a good system in place. "By embracing patterns, you're setting the stage for future redesigns," he says.

TAKING ON PUBLISHING

Finally, we touch on the other project taking up Frost's time. He is writing a book – and it's a unique one. Called *Atomic Design*, it focuses on how to craft effective interface design systems (netm.ag/atomic-265). What's really special is the book is being written live on his site, with the code hosted on GitHub.

"I'm trying to be as open as possible with the book's creation," he explains. "I have a mailing list and I'm writing about the progress and process, amongst other things." This means the community can comment on the work as it's being made. More importantly, the readers can learn from the book straight away. It seems publishing – like that big agency model – is facing some exciting changes, and becoming more flexible to meet the needs of modern audiences. ■

Brad Frost will speak at Generate New York. Buy your ticket at generateconf.com

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★ TYPOGRAPHY

HOW DO YOU CHOOSE THE RIGHT FONTS?

Legibility, accessibility, flexibility ... when it comes to fonts, it's not as simple as picking something that looks nice. Seven designers share their approaches


**MINDY WAGNER**

Senior designer, *Viget*
mindywagner.net

 I keep a running list of fonts I'd like to use some day, and when a new project comes up, I revisit it to see if there's a good fit. Lately I've been loving Adobe's Typekit integration. It's great for exploring a range of options. You can test a typeface fully and make a better case as to why clients should pay for a font. It makes the purchasing decision feel like less of a gamble.


**ALASTAIR CAMPBELL**

Accessibility director, *Nomensa*
alastairc.ac

 In terms of accessibility, there is some general advice that certain typefaces – like Verdana and Tahoma – are designed to be readable. However, it is what you do with it that counts. Don't use too many typefaces in one page, don't capitalise everything, use good contrast colours, and avoid moving text. If you aim for good readability for all, you are unlikely to create accessibility barriers.

**JESSICA HISCHE**


Lettering artist and type designer
jessicahische.is

 The first thing I do is ask myself: what kind of content do I have the most of? If it's mostly paragraph text, I'll start with a workhorse text face (something that works well at text sizes and comes in enough weights and styles). If my site is mostly imagery and I just need a font for captions and headline, I'll look for those kinds of fonts first. Generally, I'm always after something that is well made (by a skilled type designer and either created for the web or adapted well for the web) and stylish. If it utilises bleeding-edge browser capabilities (like allowing me to access OpenType features), awesome, but it has to look good in worst-case-scenario situations as well.



KAI BRACH


Web designer, OffScreen
brizk.com

 In order to provide a rounded experience to readers of my print magazine and visitors to my website alike, I've chosen the same fonts for online and offline. The initial selection was made with cross-platform availability in mind, specifically looking for a very versatile set, with many weights and styles that give me a number of options in the different use cases (for example, Regular for white on black, and Light for black on white).



DAVID HUGHES

Digital product designer, Monotype
monotype.com


 I'm not going to lie – I find choosing type for screen really challenging. There are so many variables to consider, as well as influencing factors that are way beyond your control as a designer. What type of screen will people be reading your content on? What operating system will they be running? What speed is their connection? Bloody hell, even screen brightness is a factor.

The best advice I can give is: get out of drawing tools and start prototyping, either by hand or with tools like Typecast. Test your prototype in as many different places as possible. Load it up on a bad mobile connection to see the impact when your web fonts don't load. Set appropriate fallbacks and of course, choose typefaces that were designed (or updated) for modern screen use. Eric Gill didn't create that typeface for your shiny Retina display.



SOPHIE SHEPHERD

Senior designer, Ushahidi
sophieshepherd.com

 I evaluate fonts from two perspectives: emotional and technical. On the emotional side, I find a font that 'feels' right with the content. Do the letterforms set the right mood? Is it easy to read in the context it will be used? Once I have a few options that fit the bill, I test them technically with questions like: How do they perform across multiple devices? What service is loading them in, and does that jive with the other fonts we are using? Is there room in the budget? Do we need to support multiple languages? How large is the font, and how will that affect performance? It's rare that a font passes every single test, so it's always good to prioritise them based on the project's needs.



**INAYAILI DE
LEÓN PERSSON**

Lead web designer, Canonical
yaili.com


 As an in-house designer, I have to follow our brand guidelines and design patterns, so there isn't much I can do in terms of which font I'll use for the next project! It's an interesting challenge, and something I now don't really think about. Our font has so much personality and the different weights make it versatile for different solutions.

RESOURCES


SHOPTALK

 In this ShopTalk podcast (netm.ag/shoptalk-265), Dave Rupert and Chris Coyier invite Sophie Shepherd to talk all things fonts, from blogging to overlays and Bootstrap grids. Previously at Happy Cog Austin, Shepherd is now a senior designer at Ushahidi, as well as organising the Austin Dribbble Meetup.

EXPERT TIPS

 As the type manager of Typekit, Tim Brown knows a thing or two about choosing the right fonts. In this post (netm.ag/brown-265), he showcases his 15 expert tips for getting started with web fonts – including being mindful of file size, and the vital importance of testing.

THE GOOD, THE BAD & THE GREAT

 Choosing the right font is an imperative step in creating the kind of aesthetic you're after. In this article (netm.ag/smashing-265), freelance designer Jeremiah Shoaf reviews a range of collections on the web, analysing the impact the fonts might have on the overall designs.



★ Q&A

SARAH RICHARDS

The content strategist shares the secret to creating sites that keep people out of jail



Job: Content strategist,
Citizens Advice

w: sarahjrichards.com

t: @escmum

net: Does your work at Citizens Advice differ from the work you did at GOV.UK?

SR: Both sites have the same audience – potentially anyone in the UK – but that’s pretty much where the similarity ends. We’ve done a lot of research already on the Citizens Advice Alpha (netm.ag/alpha-265) – the prototype for the new Citizens Advice service – and we know our audience searches differently, wants information displayed in a different way and responds to a completely different tone.

net: How do you go about approaching a new project, in terms of content?

SR: The most valuable thing I’ve learned is to assume nothing, question everything and research until you have nowhere else to go. Everyone at Alpha visits a bureau in their first week. Then we work out what our audience needs from us – not what they might want, or what the organisation has to say. Some organisations can get caught up in improving what they have. That’s a path to an unwieldy site. Being ruthless with content is the way to happy users. Then I would get that content researched and up. The only way to learn is to show people. I’d recommend having regular ‘crits’, where the team comment on each other’s work in a safe, open environment.

net: What’s the best way to work out the needs of the user for a particular project?

SR: Find out what the user needs to do. We run content workshops where we ask users, specialists, lawyers, whoever is relevant to work with us to define the user needs. Then we take site stats and metrics, the organisation’s aims and anything we can get from Google Analytics on the subject. We put it all together and work out what we can provide.

Next, we write those in user stories. At Citizens Advice we have two levels. We still use task-based stories, but we also have advice-based stories. We need to be far more aware of cause and effect, not just the task the user wants to complete.

net: Do you approach content strategy differently when it comes to varying devices?

SR: I really don’t see the point. A lot of organisations think their design needs to be very cut down and their words more concise for mobiles and tablets. Why? If you can get away with a clean experience and fewer words, why are you making desktop users trawl through unnecessary content? You can be boring and pointless in five words or fewer. Make all your words count and the device won’t matter.

net: How do you think style guides are going to change in the future?

SR: I have seen too many styles guides with a firm foot still in the printing style guide era. I would like to see more reliance on testing and research, rather than just tonal whims. I had the GOV.UK style guide researched by the University of Reading (netm.ag/reading-265). I wanted the government’s communications to be the most efficient they could be. That means lab and academic research. I think, as behavioural science and research becomes more sophisticated and revealing, our style guides will have to keep up, so we keep up with our audiences.

net: What benefits have you seen from successful content strategy?

SR: For GOV.UK, people need to understand their rights. A clear content strategy can, quite literally, keep people out of jail. For Citizens Advice, it means people can get guidance when they need it most. In both cases the benefit may not be numbers and website traffic, it may be knowing we are genuinely helping people. I think you can only count a strategy as successful if the audience can go in, get their task done and leave knowing they have what they want and haven’t had to work too hard for it. If you have a coherent message across all channels, using the audience’s vocabulary, you make it effortless and faster for the user. That’s success. ■



* CAREERS

TECHNICAL DIRECTION

Justin Jewett explains why being a good technical director is all about the clients

> The idea of having someone on your staff who directs your tech is pretty strange. Taken literally, it seems like you're describing someone who sits above the developers on your team and directs them to do technical things. Someone who bills hours against your development budgets but doesn't actually produce anything in the way of development ... but maybe they do sometimes – it's quite unclear. It seems like this is someone who maybe spends a lot of time in meetings 'getting to the strategic heart of things'.

That's all sort of true. But the fact that the title itself is vague, nebulous and carries so much unknown baggage with it is sort of a problem – for bosses, delegates and clients alike. Here's the basic truth: good, experienced and mindful developers are quite considerate about hitting milestones, managing their workflows, fostering a healthy environment of co-creation and contribution between themselves and their peers. They do not need an entirely separate 'talking guy' to sit in their meetings for them. A technical

director should not be seen as a slot that needs filling if your development team is already thriving.

FINDING A DEFINITION

If you do want to find someone for this role, the short version is that you don't want this person to be too technical, and you don't want them to be not technical enough. There's a balance that is needed from this position that absolutely skews towards client interaction. In other words: it's more about the clients than it is about the devs.

Here are some concrete points you can use to help form your understanding of a technical director. Firstly, what do they do?

- 1 **They protect developers** – They protect their team from themselves and others, plain and simple.
- 2 **Sell** – Nothing says 'We're serious' like a robust technical understanding of what a client is asking for, how you might do it for them, and a clear description of what challenges will need to be addressed.

- 3 **They don't develop for you** – This person should not be sitting in meetings wondering if they're personally up to the challenge being discussed. It will affect how they think, how they talk, and how they represent options to others.

All well and good, but who are they? What makes a good one? It sounds a bit touchy-feely, sure, but there are a few character traits that I believe combine to make for the right type of person in this position.

- 1 **Leader** – Simple enough.
- 2 **Strong communicator** – The entire job is about excellent, intuitive verbal and written communication.
- 3 **Funny** – This person should have a sense of humour about the challenges involved – it will charm and ultimately disarm clients, helping them trust you.
- 4 **Knows the value of saying 'no'** – 'Yes' is not always the right answer. A responsible negative presented in the context of options and alternatives is a powerful tool that should be used more often.
- 5 **Seeks patterns** – A good technical director has a passion for systems, but is not precious about them. This person visualises flowcharts and efficiencies and ways to streamline. They understand how to work smart. But once they build something up, they are unafraid to tear it back down if that's what the job calls for.
- 6 **Shares your vision ... mostly** – They don't have to be a true believer in whatever it is you think makes your organisation different, but they should be someone you trust to put you best foot out into the world. It will also help immensely if you enjoy their company and point of view.

The success or failure of a technical director has as much to do with how they are used as it does with how skilled they are. Know why you need them, what they're going to do, and how you'd like them to affect things on a day-to-day basis. You'll be surprised how smoothly the whole thing works if you do. ■

* PROFILE

Justin is the vice president and technical director at digital agency BKWLD (bkwld.com), where he oversees many aspects of the strategic, creative and technical phases of most projects

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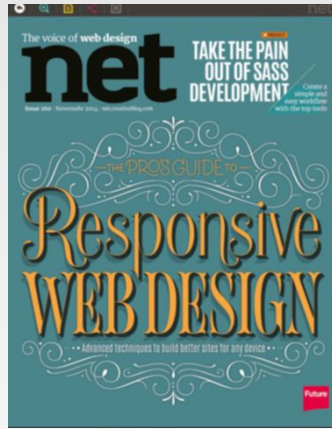


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Sam is a design educator living in Austin, TX, exploring the world of responsive web design. She teaches web design at The Iron Yard

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ARTOFTHETITLE.COM

Art of the Title artofthetitle.com, Cactuslab cactuslab.com

➤ Art of the Title is an online directory focusing on the process, history and credits of movie and television opening title sequences. The site, which was built by New Zealand-based studio Cactuslab, shows how engaging an archive can be, while still experimenting with a modular grid and white space.

In 2012, when the idea of responsive design was still fairly new, the site underwent a redesign to move it towards a more adaptive structure. "We wanted to have the feeling of a magazine, with pull quotes and images popping into the sides at various intervals," explains site editor Lola Landekic.

The team built the site using Cactuslab's in-house CMS Supermodel (supermodel.co.nz). "It provided a streamlined, custom-made backend that gave us a much faster approach to article creation and layout," comments site co-founder Ian Albinson.

The site uses VimeoPro to host the title sequences, which are made responsive by FitVids.js. "Vimeo spends hundreds of thousands of hours perfecting its experience ... not to mention covering all of the hardware, hosting and bandwidth costs of video files for a very small annual fee," says Cactuslab co-founder Matthew Buchanan.

★ FITVIDS.JS, SNAP.SVG.JS, NOUISLIDER, SVGS, JEKYLL

MADEBYFIELDWORK.COM

Fieldwork *madebyfieldwork.com*

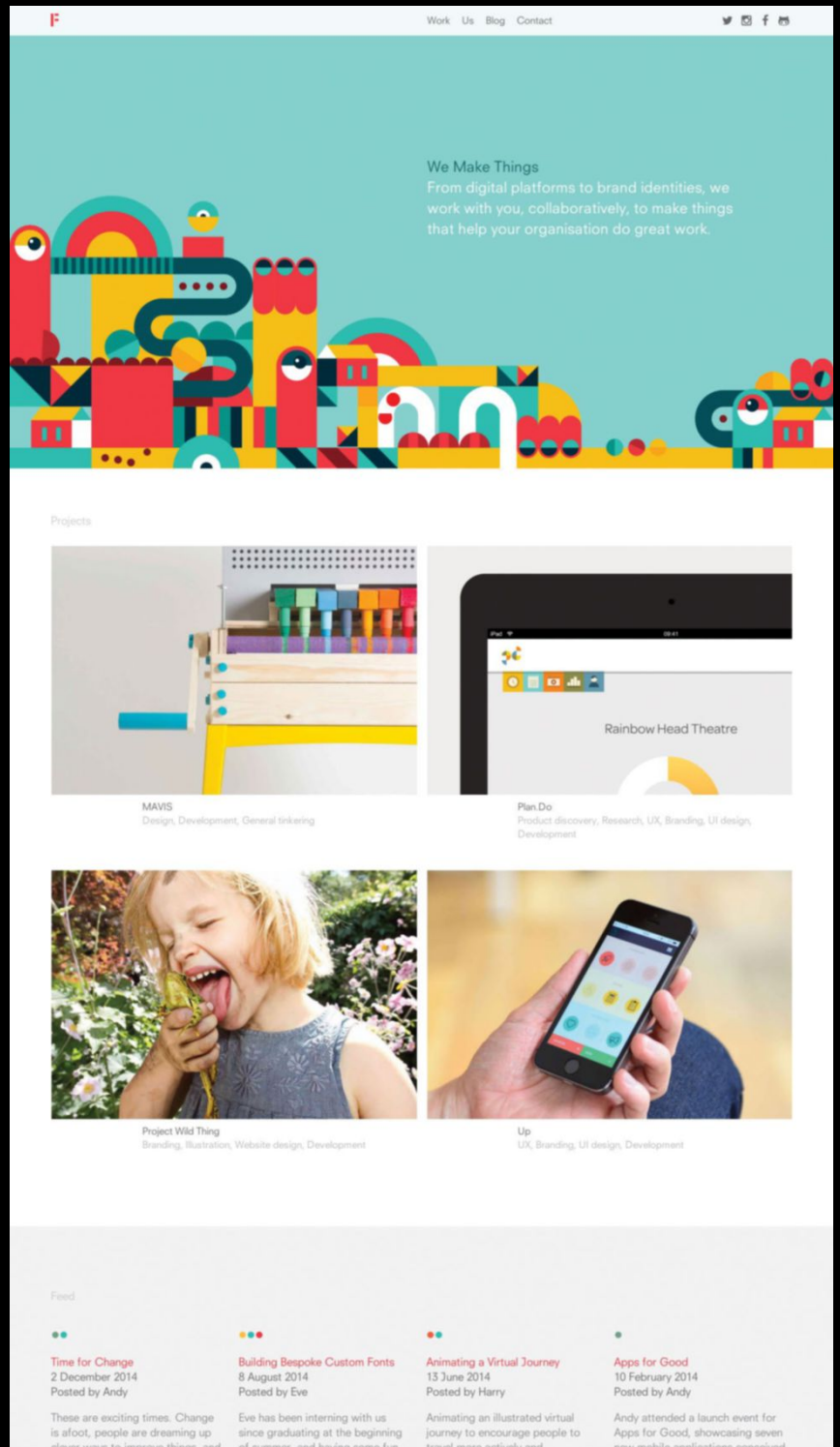
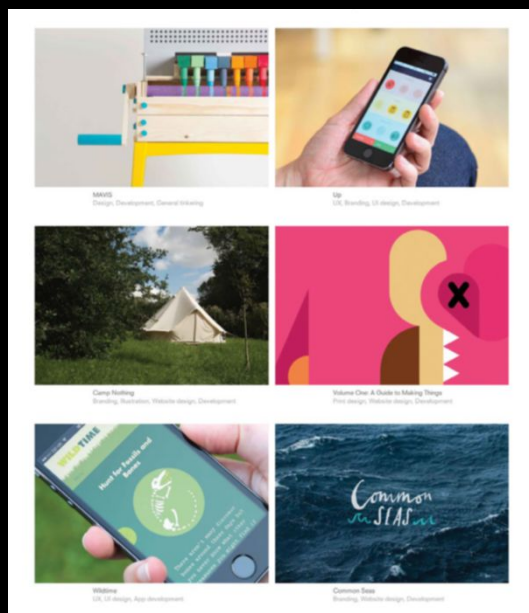
> The new site for Manchester-based, six-person design studio Fieldwork is packed with character, bursts of colour and stunning portfolio work.

"Playfulness is a really important aspect of the work we do at Fieldwork, so we had to make sure that came across on the homepage," says Loz Ives, who co-founded the studio.

The homepage shines with delightful SVG designs, many of which animate on mouse click. One animation even reveals a secret game of Pong, which uses HTML Canvas and basic JavaScript. Like the rest of the site, the Pong game is responsive, and works perfectly on mobile.

"The animation started life as a static illustration, and then the six of us gathered around one computer and worked out how we wanted the various parts to move," continues Ives. "It's surprising how tiny adjustments to tempo and easing value can make a big difference to the feel of an animation."

The design is refreshingly clean, yet modular enough to lend itself to different content needs from page to page. The team utilised tried-and-tested jQuery plugins including FitVids.js and noUiSlider, as well as library-free scripts like Snap.svg to really push the animation and interaction. The experimentation and careful consideration for the user that went into building the site is testament to just how skilled Fieldwork is.





★ WORDPRESS, ANGULARJS, ANIMATION

HARUKIMURAKAMI.COM

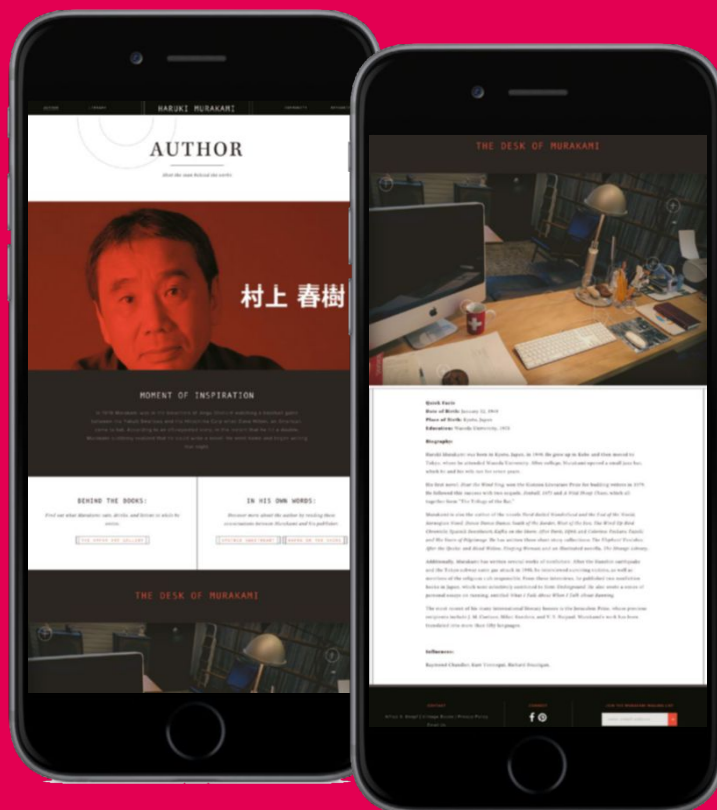
Bluecadet bluecadet.com

Japanese author Haruki Murakami is known for penning novels that deal with duality, conflict, fantasy and reality, and that are played out through multiple plot lines. His new website, designed by Philadelphia-based Bluecadet in collaboration with Knopf Doubleday Publishing Group, captures many of his novels' recurring themes.

The Library section of the site displays a selection of mesmerising covers of Murakami's novels. It makes use of subtle animation powered by AngularJS on hover states and in the background, which seduces the viewer into complete aesthetic bliss. The About section highlights what appears to be Murakami's desk, with clickable light-boxed photos of desk details captioned in the first person.

The site includes a Community page, where visitors can share and read other peoples' experiences of the author's books. As the page loads, the elements animate to give the impression of a bookstore filling up with a crowd attending a book reading.

Kepler Std, Andale Mono and Proxima Nova, served by Typekit and @font-face, look lovely together and help carry the theme of duality through the site. They work particularly well in the Resources section, where they lend a delicate and elegant aesthetic to the reading guides, reviews and conversations of Murakami's work.



“It’s such a beautiful website, and definitely shows that movement and transition are becoming increasingly popular and holistically important”

NATALIE ARMENDARIZ
(@NATALIEVI)

★ HTML5 VIDEOS, HANDLEBARS.JS

EVERLANE.COM

Everlane everlane.com

➤ An in-house team at responsible clothing company Everlane has built a site experience that makes online shopping personable again. Head of technology Nan Yu led a team of designers and engineers to craft a site as transparent as the company’s goals. The pages include plenty of simply presented information outlining facts about the factories and manufacturing process, including a breakdown in cost for each item of clothing.

Here, experience is everything. The company’s approachable brand ethos comes through in the design, right from the site’s “It’s nice to see you” login

progress bar message. While snooping around with the developer tools, I was pleasantly surprised to find a comment inviting anyone looking at the code to apply to work at Everlane.

Shopping and making returns on the site is easier than almost any online shopping experience out there. The site is easy to use and subtle in its transitions and animations (try clicking on an empty shopping cart), and product pages feature sleek photos and HTML5 videos to give shoppers a sense of how the fabric moves. Everlane is a model site that other online shopping services should learn from.

RESOURCES

Delve into the world of Murakami in even greater detail

EXCERPTS

Site of each novel by browsing through concise excerpts from each book.

MUSIC

Discover and listen to the many musical references in Murakami's work.

INTERVIEWS

Interviews with Murakami and other authors with his translators and jacket designers.

GALLERIES

View illustrations, concept photography, and other images relating to Murakami's work.

READER'S GUIDES

His world explained: Read these guides to further your knowledge.

REVIEWS

Comprehensive archive of all reviews ranging from 1999 to present day.

PROFILES & LINKS

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WAITLIST MEN

WAITLIST WOMEN

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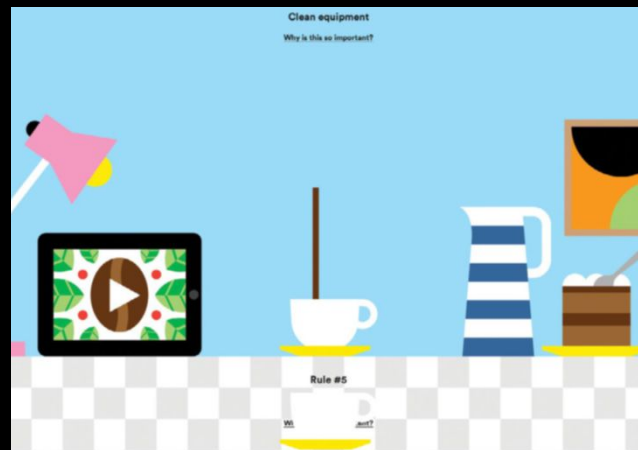
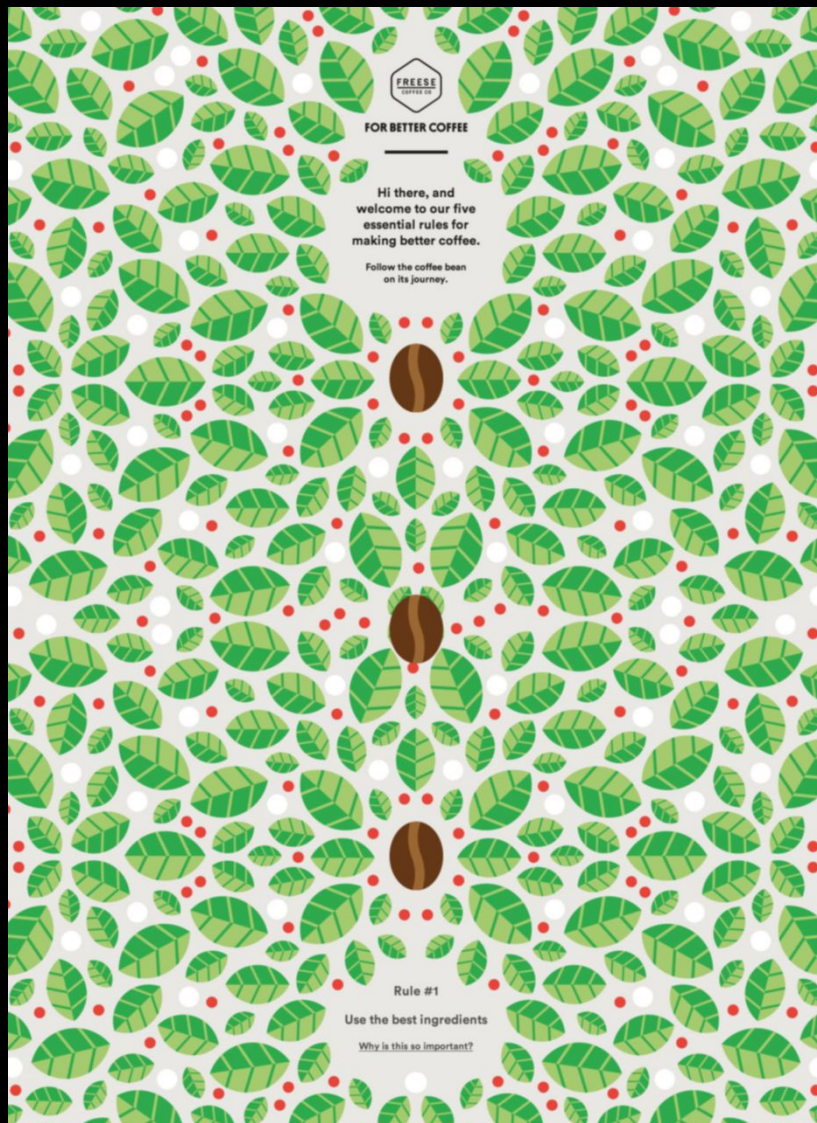


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In traditional retail, a designer shirt is marked up 8x by the time it reaches the customer. We do things differently.



* JQUERY, SCROLLMAGIC, GREENSOCK

FORBETTER.COFFEE

Agent Pekka agentpekka.com, Craig & Karl craigandkarl.com, Nordkapp nordkapp.fi

Freese Coffee's bold, clever new microsite was created with the help of Craig & Karl's brilliant illustration skills, Agent Pekka's design work and Nordkapp's development expertise.

Coffee addicts can scroll through the site, learning the five easy steps to ensure better coffee from the Finnish coffee company's 22-year old founder-barista Kalle Freese. The site is full of eye-opening, colourful illustrations and smart typography, including @font-face served Circular.

Viewers scroll to follow a coffee bean as it is ground fresh, filtered and brewed, and poured into the perfect cup, using jQuery-dependent ScrollMagic and tweening GreenSock for animations. Each section includes a commonly asked question, which links to a typographic screen overlay outlining the answer.

The site's compact content reframes effortlessly to different screen sizes, and quite a few SVGs can be found throughout the one-page site.

“How whimsical! The content is simple but the attention to detail in the illustrations and movement of the page is what makes it really stand out.”

NATALIE ARMENDARIZ
(@NATALIEVI)

★ SITELEAF, CSS ANIMATIONS & MASKS, AJAX, REQUIRE.JS, SVG

BRIANHOFFDESIGN.COM

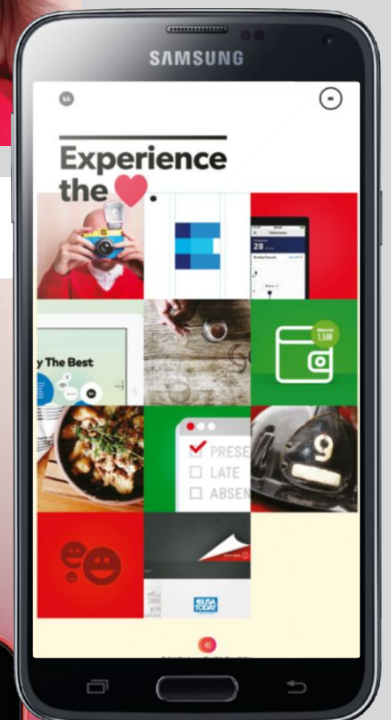
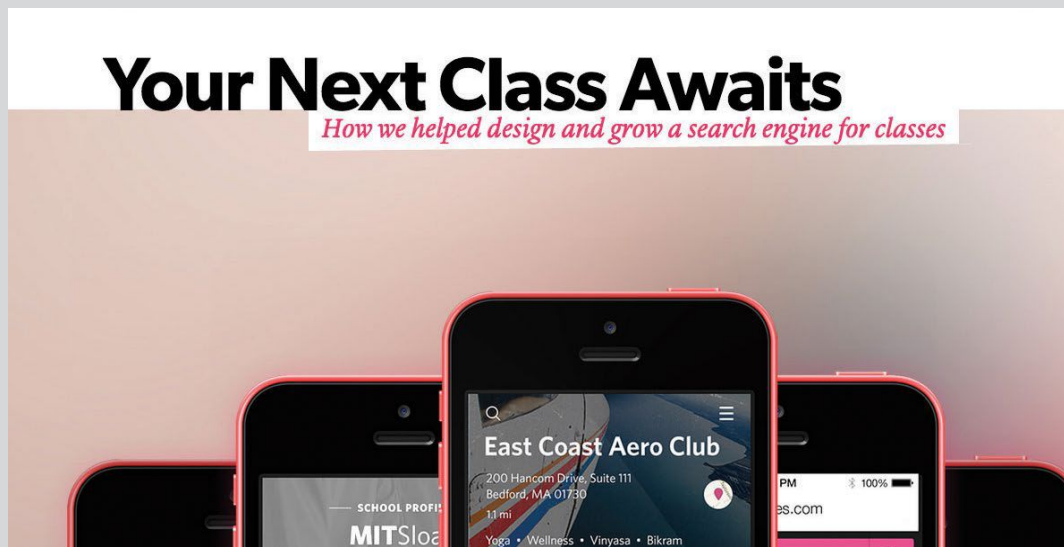
Brian Hoff BrianHoffDesign.com, Carlos Gavina carlosgavina.com

➤ Brian Hoff's new responsive website is a masterpiece of visually stunning, interactive design. Hoff himself led the art direction, design, workflows, interactions and content creation, while frontend developer Carlos Gavina took charge of development and the delicate, thoughtful animations that can be found throughout the site.

"We wanted a way to easily add in new case studies and update various parts of our site," says Hoff of the thinking behind the redesign. The new site, which is built on top of the Siteleaf CMS, focuses on new and changeable content,

including FAQs, News and Recognition, making it easy to feature and swap around different types of content such as news, blog articles, awards and case studies. "It's about adding a little somethin' somethin' for everyone to enjoy," smiles Hoff.

Hoff and Gavina have built something inspiring, and proven that great interaction does not need to come at the cost of performance: "We carefully combed through the site and dropped enhancements here and there on certain browsers that weren't performing up to our standards," Hoff explains.





*YOUTUBE IFRAME API, LEAFLET, HTML5 VIDEO, SVG

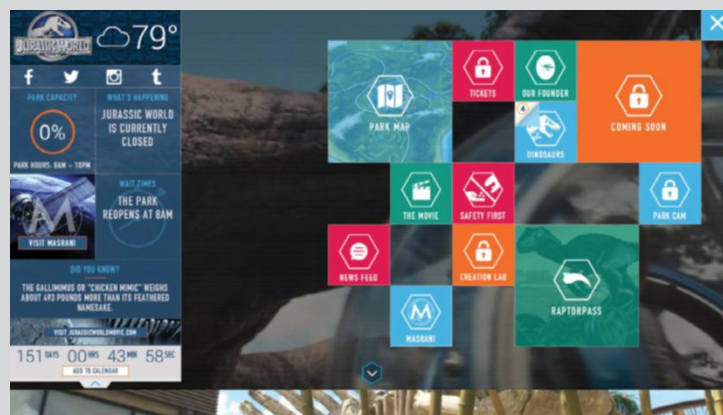
JURASSICWORLDINTL.COM

Universal Pictures universalpictures.com

➤ In late November, the new Jurassic World website was launched as a teaser for the 3D movie coming out in the summer of 2015. The whole site acts as a theme park marketing site, with opening hours, weather info, schedules, RaptorPasses, wait times, hotel info, maps and information on where to find the closest margarita, new species and safety tips on interacting with the park's large residents.

The homepage background features a looping HTML5 video showing park visitors enjoying rides and park merchandise. Each sub-page is fully responsive, making use of an openly tracked version of the DIN 1451 typeface along with flat hexagonal icons (which are linked as SVGs) to indicate the site's various sections. The code shows use of Leaflet (leafletjs.com) for the site's interactive map and jQuery for various other interactions.

The team hired by Universal and film production company Legendary worked hard to make the park site seem as real as possible. It even includes a link to the site for Masrani (masraniglobal.com) – the oil company that now owns the park and genetic research company InGen of Jurassic World, and there's a PDF – yes, PDF! – menu for the on-site restaurant named in Winston's honour. If that wasn't enough, check out the console log for a special message. [\[1\]](#)



“Hold on to your butts: the Jurassic World site is filled with striking imagery, some thoughtful interactions, and – if you look closely – more than a few Easter eggs”

ETHAN MARCOTTE (@BEEP)



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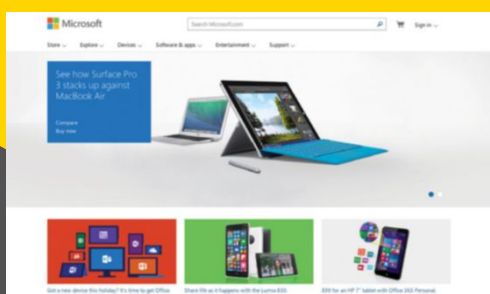
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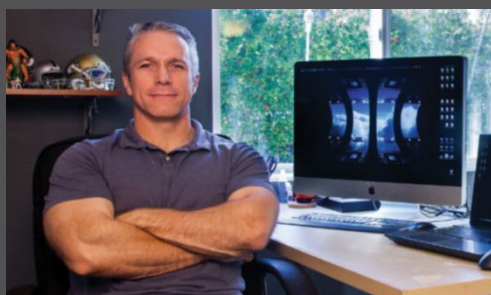
THIS MONTH FEATURING...



FOCUS ON

56

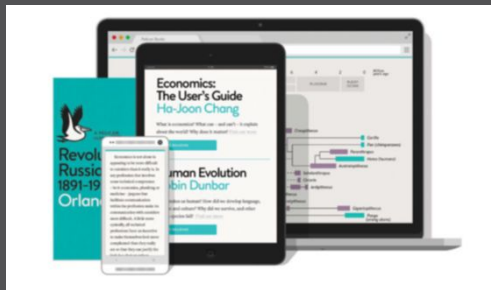
RWD takes more than just throwing in a few breakpoints. **Gene Crawford** explores the features you need for a truly responsive site



PROFILE

58

Shane Mielke – aka MilkBeast – shares some of the stories behind creating immersive 3D experiences for Hollywood's biggest brands



HOW WE BUILT

64

Fiasco Design brought Penguin Books' vision to life in a site that allows users to read key imprint Pelican's books directly in the browser

DESIGN CHALLENGE

This month...

PET-LOVERS' SOCIAL MEDIA

* PROFILES



CAROLINE SMITH

Caroline is a UX designer at Blonde, and co-founder of DabbleDabble
w: carolinepixels.com **t:** @carolinepixels



NATALIE LARKIN

Natalie is creative director at Big Bite Creative, and blogs at White Rabbit Cakery
w: netm.ag/larkin-265 **t:** @natty_larkin

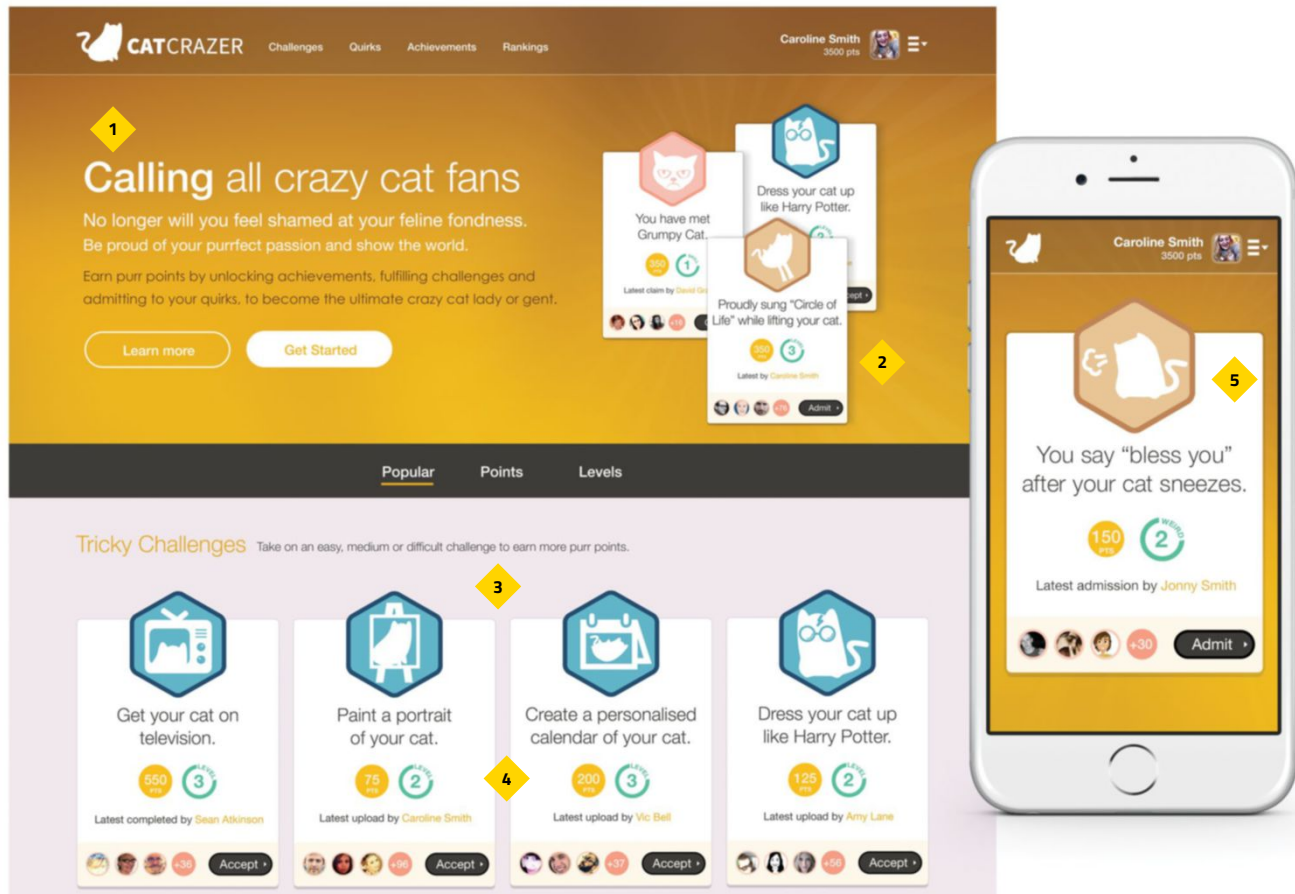


TOM WADE

Tom is the technical director at small full-service agency SteadyGo
w: steadygo.co.uk **t:** @tomwade

BRIEF

Social media goes mad for pets, so we'd like you to design a platform especially for pets and pet lovers. It could be a cute affair where people can share images of kittens, or something more serious – maybe you fancy designing a site to help owners find lost pets?



* CAROLINE SMITH

CATCRAZER

Accept challenges and reveal quirks to earn the Purr points that will cement your status as a crazy cat-person

> Catcrazer is a social community designed to celebrate those of us who have a special affinity for felines. Members can earn 'Purr points' by unlocking achievements, fulfilling challenges or admitting their quirks, to become the ultimate crazy cat-lady or -gent.

The concept is pretty ridiculous, so the design needed to be fun, engaging and playful. Users earn points to move up the rankings, and it was important to give them a taste of this right from the start, to encourage them to sign up.

Cards are defined as 'challenges', 'quirks' or 'achievements', with different rankings depending on the category. Points are rewarded when another member of the community accepts a photo of proof.

Bootstrap for HTML/CSS would give me the flexibility to make this into a responsive site. I'd also make a separate API, built in Node.js, which would make it easy to add new features or new platforms like an iOS app.

Q CLOSE UP

(1) Hero text introduces the concept to the visitor and directs them via calls to action. The copy is kept playful and witty to reflect the brand. (2) These three example cards will be animated on rollover to bring the card that is activated to the front. (3) On the bottom half of the page, content is split into three rows of four cards – a row for each of the categories ('Tricky challenges', 'Common quirks' and 'True achievements'). (4) Selecting the tabs would filter the content of these cards by either popularity, amount of points available or level value. (5) Each card has a badge made up of the selected category colour and an icon, 140-character headline text, points available, a 'difficulty', 'weirdness' or 'skill' level depending on the category, details of the latest member to upload proof and avatars of members who have successfully completed the card.

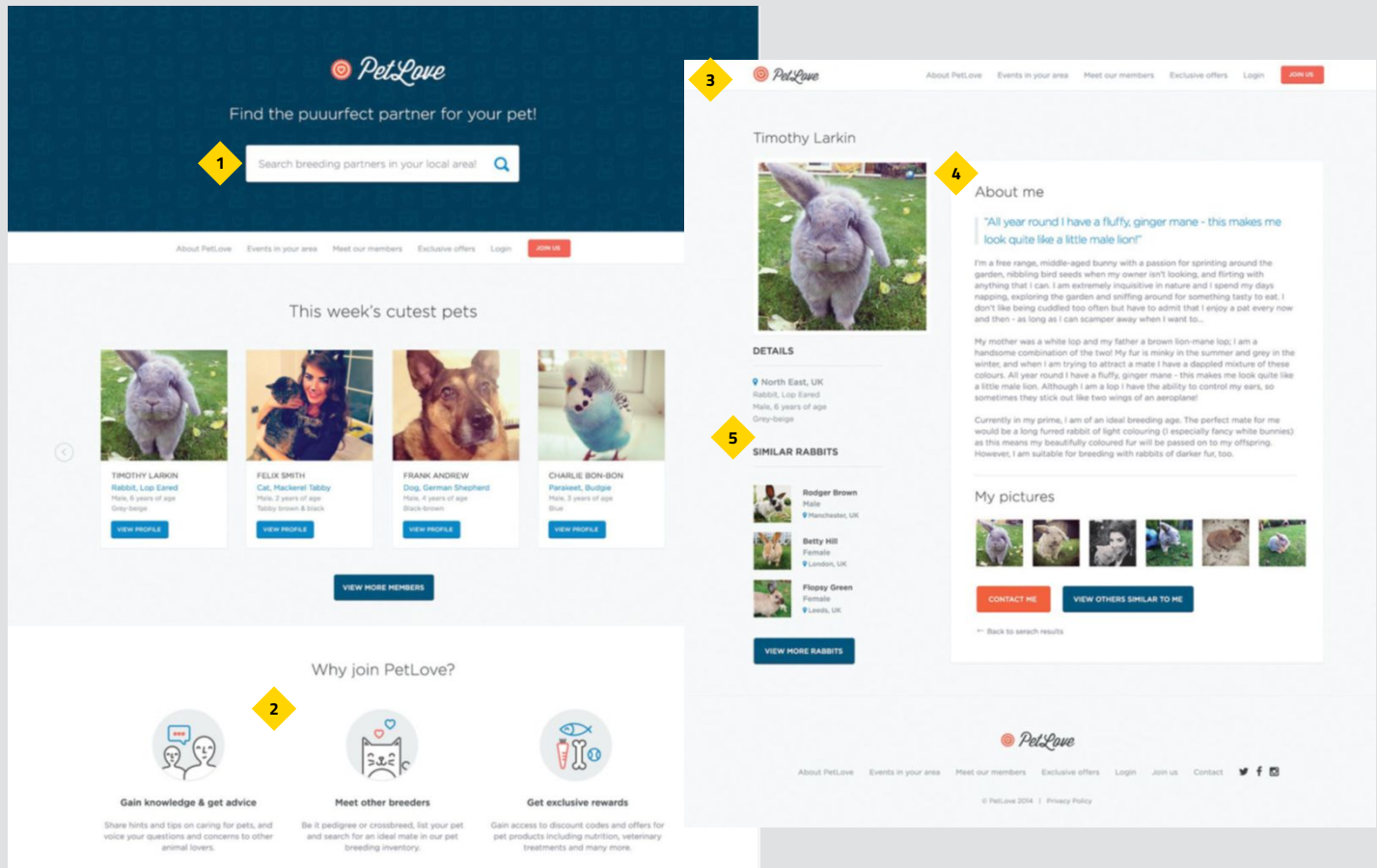
MY MONTH

What have you been doing this month?
Moved to Edinburgh and started a new job with Blonde, and worked on App Delight – a project for DabbleDabble.

Which sites have you visited for inspiration?
Captivate.co for app interactions and *Behance.net* for general creativity.

What have you been watching?
The Lego Movie on repeat. Everything is awesome!

What have you been listening to?
Lots of Goldfrapp, Ellie Goulding and Marina & the Diamonds.



MY MONTH

What have you been doing this month?
Working on an exciting rebrand project for a US-based client.

Which sites have you visited for inspiration?
I love Pinterest – it houses design work as well as photos of interiors, pets, people, food and much more – great for helping you think outside the box.

What have you been watching?
I recently went to see *Exodus* at the cinema – the graphics were amazing.

What have you been listening to?
I'm a sucker for Taylor Swift. She makes me feel happy!

* NATALIE LARKIN

PETLOVE

Match.com comes to the animal kingdom with a site that helps breeders find their pet's perfect partner

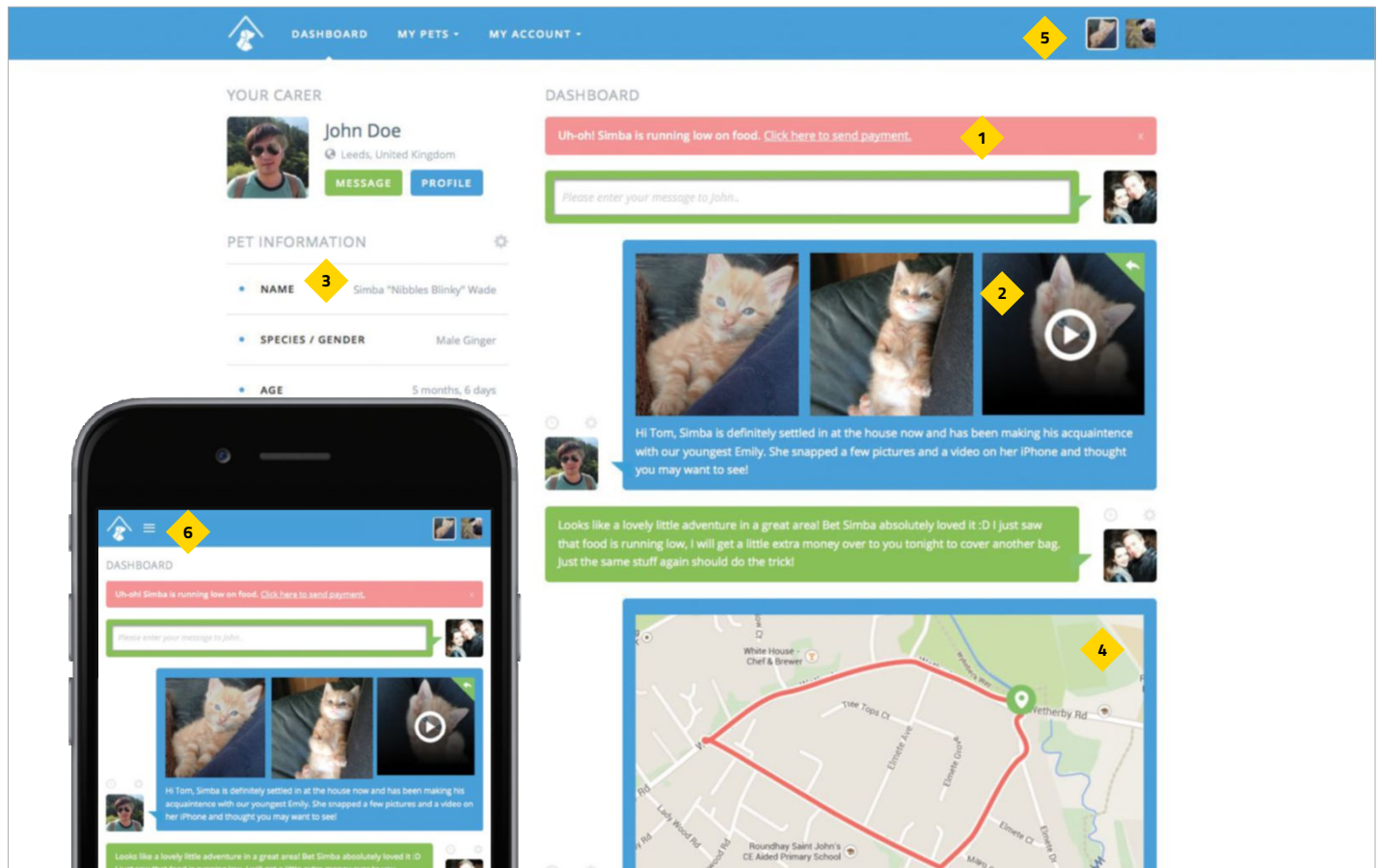
> PetLove is a dating website for animals, where owners can search for matching mates for their pets. It enables the user to create a profile page for their pet, including key features, a large profile picture, bio and image gallery. This could be pulled in from Instagram to make managing the gallery easy.

The website has a search feature in the header area, which encourages people to start looking for a match. This would then take the user on to a more detailed page with filters, enabling them to select exactly what species, breed, colour and age of animal they are looking for.

The homepage showcases 'This week's cutest pets' which would be randomly selected from the newest members, refreshing on each page load. The website also allows users to share advice and get exclusive rewards – including discount codes for pet products like nutrition and veterinary treatments – that are only available to PetLove members.

Q CLOSE UP

(1) The main aim of the homepage is to encourage the user to do a quick search of the animal they're looking for. This would then take them onto a more detailed page with different options, such as breed, age, colour, sex and so on. (2) Eye-catching, quirky illustrations sum up why users should join and the benefits they could receive. (3) The navigation would stick after scrolling past the header, so the user always has access to all features on the site. (4) The profile page gives the user a chance to let their pet's personality shine, whilst showing off pictures and quotes. (5) Similar results are listed in the left-hand corner to help people searching for a mate find exactly what they're looking for.



* TOM WADE

CITY SITTER

Owners can rest assured when travelling, thanks to this handy service that helps them find a reliable pet-sitter

I recently went abroad with my girlfriend, and we regretfully needed to leave our kitten behind to be looked after by friends and family. City Sitter is a networking tool for those not fortunate enough to have that fallback. It connects pet owners with prospective short-term carers who, for a small fee, can take in your pet and care for them.

With a frontend listing and user peer review system similar to that of Airbnb (only cuter), the site enables connected users to have one-to-one communication with carers, to both inform and reassure them. This takes place via a centralised dashboard that shows messages, manages contact details, allows for micropayments to be made and provides document management to share information.

I've created a clear and uncluttered site inspired by flat and material design. I've used Bootstrap for the structure across all devices and a central Node.js service to push content live.

Q CLOSE UP

(1) Payments, such as the initial rate and money for additional food, may be requested and sent using the Stripe payment gateway. (2) Images and videos can be uploaded to a gallery and then shared to social networks on hover, if the user wants to show off how cute their pet is. (3) Valuable information about the pet and relevant contacts are stored in a prominent and easy to access location. (4) By connecting to a tracking device, a route can be mapped to show where pets have been walked. (5) Users with multiple pets can toggle between unique dashboards, or choose a combined dashboard showing data for all pets. (6) The mobile and tablet versions prioritise the dashboard and messaging areas, displaying the carer information in a left-hand slide-out menu.

MY MONTH

What have you been doing this month?
The online build of an upcoming national TV show.

Which sites have you visited for inspiration?
ThemeForest for trending design inspiration.

What have you been watching?
I recently finished rewatching *Prison Break* and have started series one of 24.

What have you been listening to?
I'm going to see Astronautalis and Placebo soon, so I've been refreshing my memory with their albums.

★ FOCUS ON

FULLY RESPONSIVE

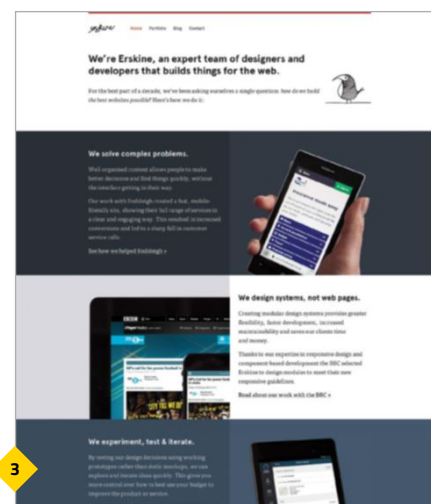
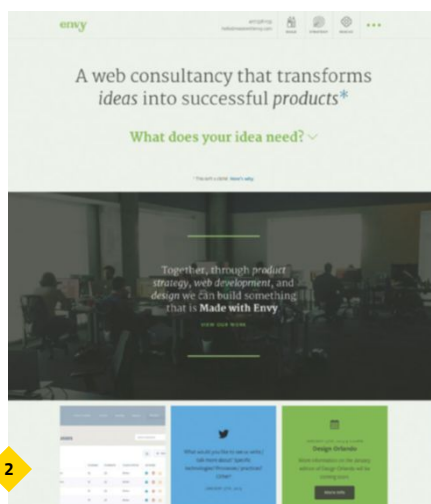
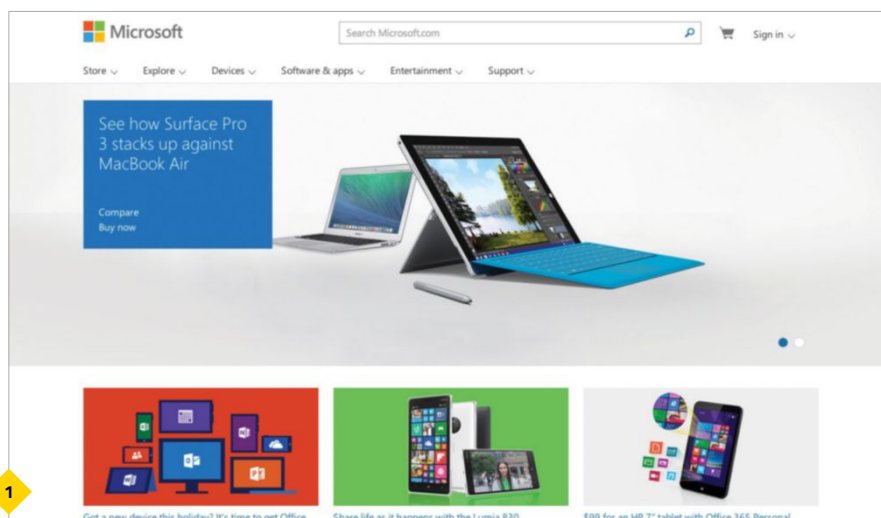
Gene Crawford explains why, in order to make your sites truly responsive, you need to look beyond the breakpoints

➤ As the main editor of *UnmatchedStyle.com*, I review a lot of websites. And while most of them are 'responsive', there is still a very large majority that are not what could be called 'fully responsive'.

It's worth stating here what makes up a responsive website. A website is responsive if it utilises all three of the following: flexible images, media queries and a fluid, proportion-based grid. When done properly, there's true magic here. When you apply this responsive approach to building, alongside thinking mobile-first, you essentially future-proof your website.

It is not enough to grab a few specific media queries that target popular devices and design for those. There are so many different devices – mobile and otherwise – out there in the world, that you simply can't take them all into account. You have to design for the in-between stuff. The only way to do that is to think mobile-first when you are applying these responsive techniques to your projects.

Herein lies the beauty that we, as web designers, bring to the table. What we do is more than simply making something pretty or visually slick. We get to take things deeper and work with how we communicate to the audience with the content, the visuals and the interactions, across many different mediums. It is a lot to keep on top of, but it is what separates us, as web designers, from other disciplines of design. ■



(1) The Microsoft (microsoft.com) website shifts beautifully between known, device-specific screen widths and everything else that

'could be' out there. (2) Web design and development firm Envy (madewithenvy.com) scales its website's elements well no matter what screen width

you may have. It also utilises some known device breakpoints for major navigation design changes. (3) With its responsive design approach,

the website for web design and development agency Erskine (erskindesign.com), is a great example of working between breakpoints.

★ PROFILE



Gene's mission is to work tirelessly to provide inspiration and insight for developers. His recent projects include *unmatchedstyle.com*

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★ PROFILE

SHANE MIELKE

shanemielke.com

This master-of-all-trades is as happy coding as he is animating or art directing ... just don't ask him to sit still



Shane Mielke's client list boasts some of Hollywood's biggest blockbusting franchises. He's broken new ground with immersive 3D experiences for the likes of *The Hunger Games*, *Batman*, *The Lord of the Rings* and *Transformers*. However, Mielke is adamant that the aim of the web is very different to that of the cinema. We caught up with the freelancer to find out what's so good about WebGL, how you take direction from the likes of Peter Jackson, and why web experiences have a magic all of their very own ...



net: Who are you and what do you do?

SM: Some people remember me by my original moniker, 'Pixelranger'. I am a freelance creative director, designer, developer, animator, photographer, author and speaker working on award-winning interactive projects.

net: How did you first get started in digital creativity?

SM: Back in college, a friend of mine had a fancy computer with 3D apps, Illustrator and Photoshop which he used to make fake

IDs for extra money. I stared in awe the day he scanned a picture of me, Photoshopped it into another scanned photo of Arnold Schwarzenegger working out, and then printed it out on photo paper. I was immediately hooked.

After I graduated college I got a job working at a tiny web development company that wasn't making much money – probably because none of us knew what we were doing. I worked all day and night those first two years but I was having so much fun learning that I didn't care.

INFO

Location: Orange County, California

Established: 1996

Clients: Adobe, Ford, Warner Bros.

Awards: 32 FWA Sites of the Day, two FWA Sites of the Month, three FWA Mobile of the Day, one Adobe Cutting Edge Award, two Awwwards

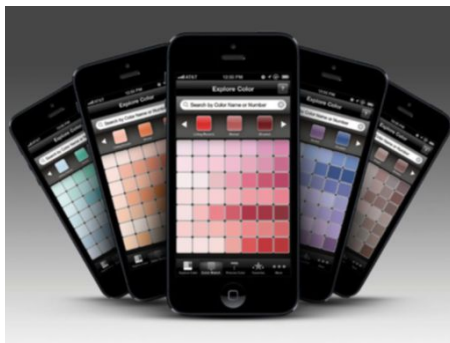
Epic Mickey 2 As art director, Mielke worked on the design and animation for this Disney game, including creating the main menu, storyboards and animation prototypes



Once I met my future wife, I knew I had to get serious and become more financially secure for the both of us. So I focused more on my career path and the type and quality of work I was doing. I started learning Flash and slowly moved up the agency ladder.

net: What are your career highlights?

SM: Launching my original *Pixelranger.com* portfolio site. A 10-year career as a creative director of 2Advanced. The design and animation of Disney's *Epic Mickey 2* video game. Working on projects for companies and global brands like Adobe, Batman, Call of Duty, Disney, Ford, Lord of the Rings, and Transformers. Being named one of *net*'s top 50 designers in 2014.



Above The Behr ColourSmart app helps users see how paint colours will look in their home
Right Memorabilia from various points in Mielke's life, including his work on several Star Wars sites, and his stint as a collegiate football player

I've always said that my biggest career achievement is being able to do something I love. I thank God every day for the fact that I stumbled into a career that keeps me happy, challenged, creative and paid.

net: How do you choose your projects?

SM: To be honest, they've chosen me most of the time. But I think that's because I've spent the past 15 years in the industry trying to cultivate a reputation for the type of work I like doing and want to be known for. Over the course of my career I've seen so many more talented people fall off the grid into obscurity, losing control over their creative destiny. For that reason I've kept an updated portfolio presence since 2002.



I've also made sure to stay humble, give my best on every project (the good and the bad) and to develop true relationships with the people I've worked with. So when my genre of project comes up or someone needs a little extra muscle, I'm fortunate that people think of me.

net: You have skills in a lot of different creative areas ...

SM: Yes. That also makes choosing projects a little bit easier. I can pick from all types of projects – design, development, animation. I'm not limited to any one aspect of a project. Everything is fun to me, so I get excited no matter what the project is ... that is, as long as I'm not doing so much of any one thing I get bored or rusty in my skills. Sometimes I'll be juggling different projects at one time, designing in one window, coding HTML/JS/CSS in another while also jamming on an immersive WebGL-based experience site. Sometimes all three of those worlds collide in one project and then the magic happens!

net: As a freelance art director, how hands-on do you like to be?

SM: I like to lead by example. While I can sit back and just lead a team if needed, I'm one of those old-school black unicorns who likes to play on as many aspects of a project as I can. That's where the fun is at. I'll wireframe, design, render, photograph,



Batmobile experience This site celebrating the conclusion of the Arkham game series saw Mielke dipping his toe into WebGL for the first time. He worked with three.js and handled design, code and animation

build, code and animate everything from start to finish if I need. There is no task too big or too small that I can't or won't do.

net: The Batman: Arkham Knight – Batmobile Experience (netm.ag/bat-265) is an amazing feat. What would you say are the site's biggest achievements?

SM: That was my first WebGL project so everything in the site was a big achievement to me! I had to literally learn everything as I went – I went through lots of tutorials and source code, constantly searched Google and *StackOverflow.com* and bugged friends who were more knowledgeable than me.

The biggest achievement was actually getting final approval. The team at Five & Done (*fiveanddone.com*) put in a lot of time pushing for the concept – the experience was almost just a basic image gallery, which would have been tragic. Warner Brothers was very sensitive about featuring the Batmobile in a WebGL setting unless it looked *exactly* like it did in the game. Since

we couldn't guarantee that, we came up with a treatment that felt holographic and creative enough to differentiate itself from the game version.

net: You do a lot of work with film studios. How cinematic do you think the web can become?

SM: The web has its own version of 'cinematic' which is completely different from what you experience in a movie. It's a magical mixture achieved by combining all sorts of different creative assets and tools to create a unique interactive experience that doesn't have to be 100 per cent realistic. It can look however we want it to as long as it is authentic and compelling.

Nothing will ever compare to real photo or video content. Even though CG has become very real-looking, we still have blockbuster movies with multimillion-dollar budgets that took years to make, where it is easy to pick apart the CG bits. For the most part our eyes know when we're looking at something that was



* OFFICE CULTURE



SHANE MIELKE

Little things that make your life worthwhile

Websites: *StackOverflow.com*, *Duolingo.com*, *Youtube.com*

Apps: Instagram, Snapseed, Rhapsody

Reading: *Learning to Breathe Fire* by J.C. Herz

What do you have on the walls?

Shelves with mementos from past projects and video games. I also have pictures of my father and grandmother who passed away last year.

What will you do for lunch?

I've always eaten my lunch at my desk. This means I can spend more time with my family or on any other activities I might want to finish my day with.

What hours do you work?

I sit down to work around 10am and work uninterrupted until 4-5pm. I avoid any work in the evenings or weekends unless there is a project launching that needs some extra time.

What else do you do in the office?

I always have movies or music playing in the background. Once the kids get home from school, they individually come into the office to read or do homework.

How often do you hang out with other designers?

There are a few local designer and developer friends and we all have season passes to Disneyland. Every couple of months we meet up to get the kids together.

Describe your working culture in three words ...

Organised multi-tasking chaos.



★TIMELINE

A look at the dates that shaped Shane Mielke's career

OCT 1996

Uses Photoshop and HTML for the first time



JULY 1997

Starts career as designer



AUG 2000

Gets married



JAN 2001

Starts learning Flash



MAY 2002

Launches *Pixelranger.com* portfolio site



AUG 2002

Joins the team at 2Advanced



MAY 2005

First daughter, Tristen, is born. Second daughter, Taylor, follows in 2008



NOV 2012

Works on design and animation for Epic Mickey 2



DEC 2012

Leaves to start freelance career



DEC 2013

Launches *The Hobbit: The Desolation of Smaug* movie website



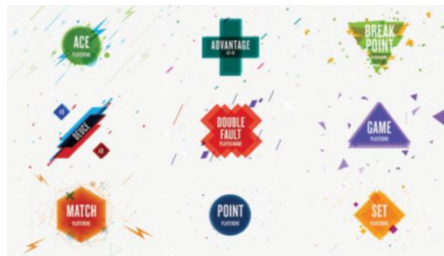
JAN 2014

Starts experimenting with WebGL and Canvas



JUN 2014

Takes on first WebGL project: Batman: Arkham Knight – Batmobile Experience



- created on a computer. Expecting 100 per cent cinematic reality in the window of a browser just isn't realistic.

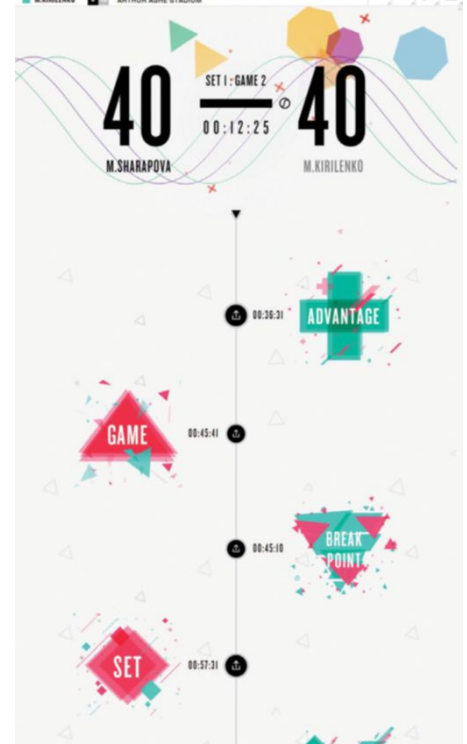
net: What technologies are getting you excited at the moment?

SM: Canvas and WebGL development are skills I've picked up over the past year-and-a-half that really have me excited. The possibilities are endless, and the web feels fun again. I'm especially excited about the three.js 3D library (*threejs.org*). It was used on the Batmobile Experience site. It's a rush to see immersive 3D working in the browser on both desktop and mobile.

net: When you're working with a big studio's intellectual property, how involved are they creatively?

SM: It depends upon the studio and project. Some studios want me to bring my years of experience to a project. They typically let me run with everything, which is a lot of fun but can also be a little stressful. Other studios know exactly what they want, giving me lots of direction. In those situations it's my job to fulfil their vision without any ego whatsoever.

It gets really interesting when the actual director of a movie is involved and must approve all creative. I've had that happen with Michael Bay on several Transformers projects and Peter Jackson on the Lord of the Rings work. It's a stressful rush knowing that people like that are reviewing



The US Open sessions This project saw Mielke create visuals based on live tennis stats for IBM and Tool of North America

your work. When the director of a film picks a design direction or tells you to change an image or a colour, there's no arguing it.

net: Do you ever yearn to make something that's simple?

SM: I actually love clean, simple design – it's just that I'm seldom asked to do it professionally. I let my simple side shine through with my photography (*terraspirit.com*). I try and avoid using Photoshop or any extreme editing. I see some people using extreme HDR techniques, and their images look like they were fried in a microwave. I try to not use Photoshop as a crutch to make up for my lack of technical skills with the camera, so I do all of my edits with the settings on the camera if possible.

net: Should we really call you MilkBeast?

SM: That was a nickname given to me by my friend Bradley G Munkowitz (aka Gmunk). The first part comes from how my last name is pronounced 'Milky'. Beast comes from the fact that I'm a former collegiate football player and CrossFit junkie who works out five or six times a week, and sometimes multiple times a day. So I've been told I don't look like a stereotypical designer/developer – hence the name 'MilkBeast'. I always liked the sound of it, so I threw it on my website as a joke to see if people would use it. **n**



Next month: We chat to creatives at international agency thoughtbot

The number one
destination for **web design**
news, views and how-tos.



Graphic design

Web design

3D

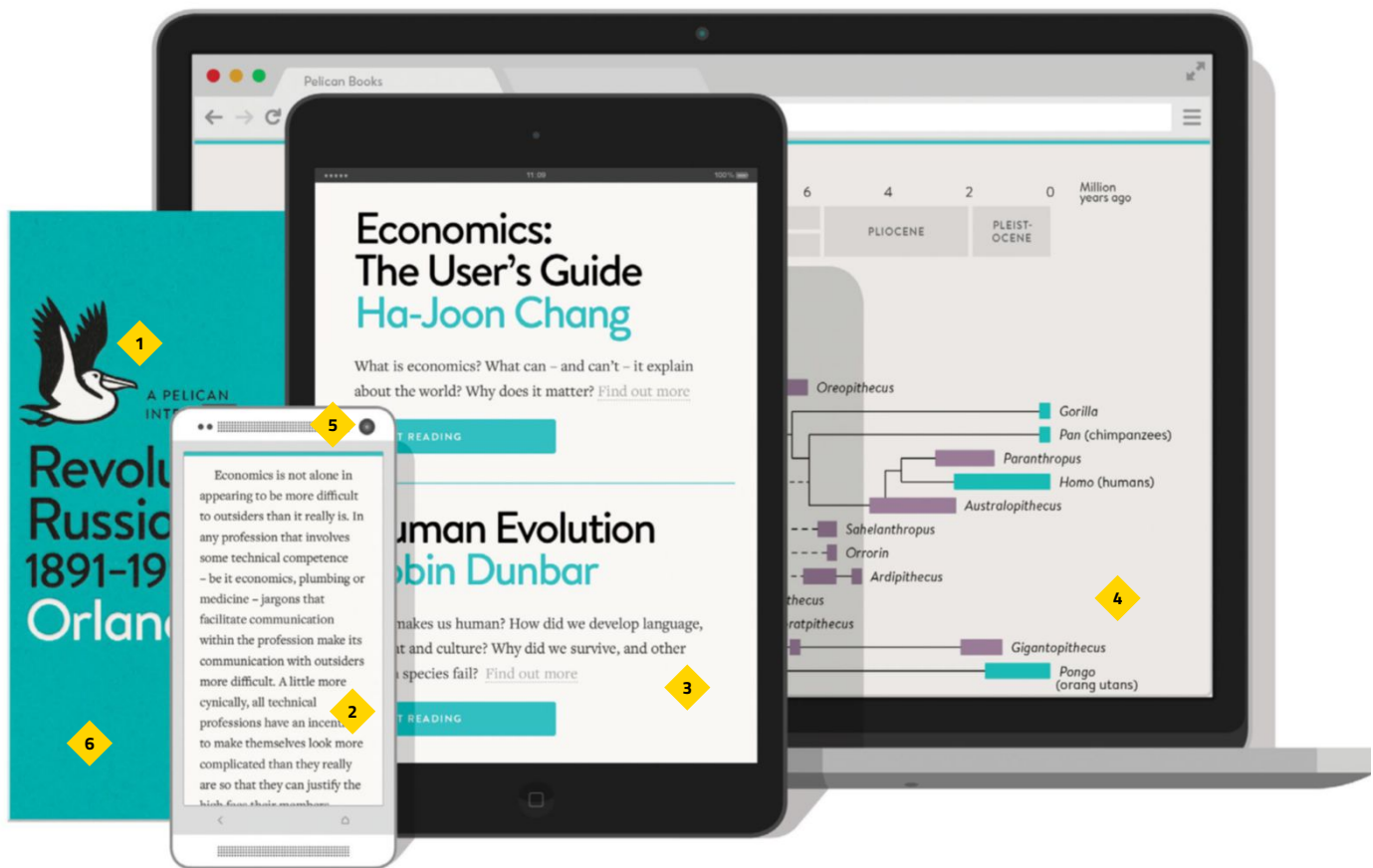
Digital art

www.creativebloq.com

* HOW WE BUILT

PELICAN

Fiasco Design and Penguin Books came together to create a flexible new site that brought a key imprint to a connected audience



BRIEF

When Penguin came up with a new way for Pelican books to be read online, through the browser, Fiasco Design was tasked with bringing its vision to life. The result needed to be accessible and distinctive, as well as simple to use, requiring little to no explanation or direction.

CLOSE UP

(1) As part of the relaunch of the brand, the iconic Pelican logo was redesigned and brought soaring into the 21st Century. (2) Getting the reading experience on mobile right was so important for this project. Offering the option to adjust the font size means the user can customise their experience to suit their personal preferences. (3) Once users purchase a book, it's added to their library so they can pick up where they left off and start reading

wherever they are. (4) The books on offer include rich media such as images, video, maps and animated graphs, all of which are built to work on any device. (5) The site was designed mobile-first as it was expected that the majority of users would be using the site on the move, rather than on desktop devices. (6) The front covers are just as distinctive on a smartphone as they are in paperback, helping to support and reinforce the Pelican brand.

BEN STEERS



Ben is co-founder and creative director at Fiasco Design, a freelance designer and perpetual doer

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t: @BenSteers

TOM MORRIS



Tom is a Bristolian designer, poet and preacher who loves imagining better communities. He is head of digital at Fiasco

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MATTHEW YOUNG



Matthew is a cover designer for Penguin. He's also a web developer and occasional illustrator and animator

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t: @matthewyoung

> Having already worked with Penguin on a number of web projects, Bristol-based Fiasco Design was asked to pitch for the creation of an innovative new website for Penguin imprint Pelican (pelicanbooks.com). Its aim? To offer a way for users to read Pelican books online, bringing the iconic brand into the 21st century and attracting a new, connected audience. We spoke to creatives involved to find out how they took up the challenge.

net: How did the project come about?
MY: In early 2013 we were informed that the Pelican imprint was being relaunched. The two key things in the brief were that these books needed to be accessible, and they needed to be distinctive. I suggested that to make the books truly accessible, and to reach a young, connected audience, we should make them available to read online. We spent a long time discussing things, conducting research, and working out the direction for the site, and then in December 2013 we brought Fiasco on board to help turn the idea into a reality.

net: What was the brief?
BS: The vision was to create an innovative way for Pelican books to be read online through the browser, removing the need for e-reader type devices, which have limitations. The site needed to be simple to use and user journeys needed to be as short as possible. The design and functions had to be straightforward and require little to no explanation – the fewer buttons and options available, the better.

net: How closely did you work together?
BS: We worked closely with Penguin throughout the duration of the 11-month project. We set up a fairly rigid timeline and worked in week-long sprints, meeting every Friday afternoon to demo and review all the work from that week. This was really effective as it helped keep the project on track and iron out any issues that occurred along the way.

net: What kind of research did you carry out before turning the first pixel?
MY: A few years ago I wrote a dissertation on the subject of legibility and readability, studying in depth how people read and process information, so that informed a lot of my initial thinking. We also researched our target audience, how they might use the site and what features would be most useful to our readers. Obviously we researched the competition, the technical constraints, browser support and so on.

net: At the start of the project, what were the key technical decisions you took?
TM: Most of our technical decisions were built into the brief itself. Early on, we recognised the need for effective social sharing functions and small details. We saw the need for a really tailored outcome and so left alone more popular CMSs like WordPress, in favour of Keystone and working with Node.js, which didn't have lots of unnecessary functions built in. It was also really useful to use version control, as it was a highly collaborative process between us and Penguin.



★ TIMELINE

The Pelican project in milestone events

MARCH 2013

It is announced that the Pelican imprint is to be relaunched



MARCH 2013

Matthew Young builds a prototype responsive website and pitches the idea of books in the browser



APRIL-JUNE 2013

Penguin researches the potential of the concept and pins down its strategy



DECEMBER 2013

Fiasco Design is brought on board to help design and build the site



OCT 2013-SEPT 2014

The online books and paperback books are designed at the same time, ensuring everything is coherent and works well across all formats



MARCH-SEPT 2014

Fiasco builds the foundations of the site – a Node.js app running Keystone for the CMS



ONGOING

Penguin reviews and iterates the site frequently



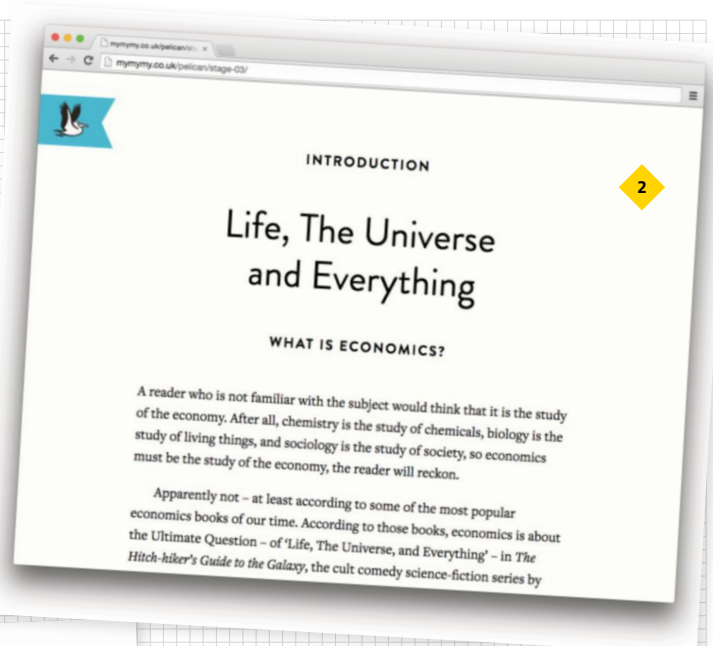
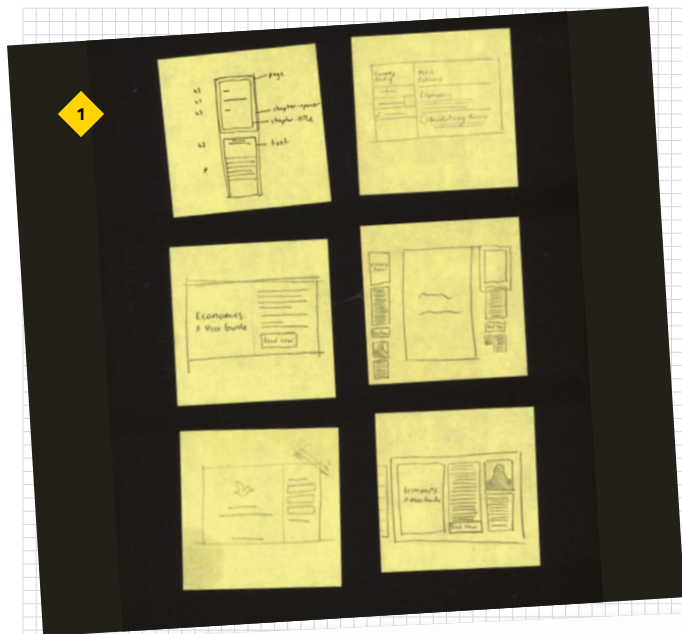
ONGOING

The site is thoroughly tested across different devices, browsers and operating systems to check for errors



NOV 2014

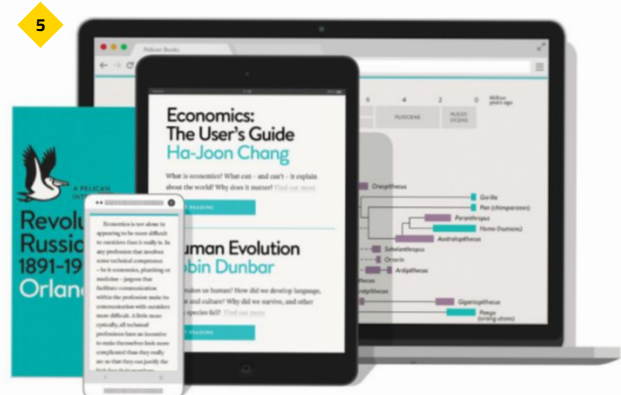
The site launches with five books available to buy and read online. More books will be added throughout 2015 and beyond



* EVOLUTION

A look at how the Pelican website evolved over the course of the 11-month project

(1) Initial wireframes of the website were drawn out on Post-it notes. (2) The very first prototype was a very basic, one-page responsive website, with a big emphasis on typography and hierarchy. (3) Early cover experiments looked at establishing a responsive cover that worked at any size, in print and online. (4) The menu is designed to be clear and easy to use, and very distinctively 'Pelican'. (5) Pelican books aim to offer the best possible reading experience for any format, and any screen size or resolution – including rich media elements such as charts.



► **net:** Can you talk us through the design and typographic decisions you made?

MY: For me legibility is the most important part of the whole site – my aim is to provide a comfortable, enjoyable reading experience. That’s relatively easy to achieve in print, where I’m used to having extremely fine-grained control of the typography and layout of the page. However, when designing for the web it’s a completely different story due to the profusion of different devices and resolutions. What we created needed to offer the best reading experience no matter how you’re reading these books – be that in paperback, on an old smartphone, the latest tablet, a huge desktop monitor, or anything else.

I had to find typefaces that work just as well online as they do in print. I chose Brandon Text for headlines and Freight Text for body copy. Both have generous x-heights and come with good web font versions, manually hinted for use on screen at different sizes.

net: What are the key constituents of a good reading experience?

BS: Generally, it’s about effective communication of content. For this project, though, we had a rare opportunity to design for a longform, more formal reading experience. Here, maximum comfort was essential to avoid distractions from the informative subject matter. So we focused on classic typographic rules concerning line-lengths, letter spacing



Keeping it simple The site design was stripped back to include as few elements and buttons as possible

and font sizes. The digital format also meant we could accommodate for certain personal preferences with custom type sizing features.

MY: A good reading experience is one that is easy and comfortable. The line lengths should be in the sweet spot between 45–70 characters long, and there should be a generous amount of white space around the lines. You want the text to have good contrast, but not too stark, and any navigation should be seamless.

net: Which technologies did you use?

TM: We built the website with Node.js, using MongoDB for the database and Stripe for making payments. All that was managed through Keystone as a CMS, and we compiled our CSS using Sass. We kept track of everything with the Git version control system.

net: Did mobile present any challenges?


MY: Mobile does present an interesting challenge, particularly when it comes to non-textual elements. I’ve read ebooks where I’ve come across a table or a map and it’s been too small to interpret. We put a big effort into making sure all non-textual elements are legible and easy to understand, even at small screen sizes.

net: Do you think browsers will eventually take over from e-readers?

TM: We do. Rationally speaking, they should. But people are not always so rational. We wrote a blog post a while back explaining some of our thoughts on this (netm.ag/blog-265). Essentially, the unique benefits that e-readers provide are going to be superseded by devices very soon.

MY: The web is thriving at the moment, and web apps are becoming more useful and more powerful. In theory at least, web apps can do almost anything an iOS or Android app can do – and I’m not just talking about e-reader apps here. The added advantage of doing things in the browser is that it’s completely device-agnostic and can be accessed anywhere on any OS. However, I think there’s still a long way to go before the web starts to replace dedicated apps completely.

net: What’s the reaction been like?

MY: Great! Since we launched, the average time on site has been 26 minutes – or 36 minutes for logged-in users – which shows people are really engaging with the content – and many readers are sharing extracts on Facebook and Twitter. 

Why Are People Not Very Interested in Economics?

Since you have picked up this book, you probably have at least a passing interest in economics. Even so, you may be reading this with some trepidation. Economics is supposed to be difficult – perhaps not physics-difficult but demanding enough. Some of you may remember hearing an economist on the radio making an argument that the economy is in a state of collapse, and you haven’t even read a proper book on economics.

But is economics really that difficult? It doesn’t need to be – if it is explained in plain terms. In my previous book, *23 Things They Don’t Tell You about Capitalism*, I even took my book out and said that as

Sharing The design encourages readers to interact, and share content on social media

Classic animation principles can help you create amazing interface animations. **Val Head** gives you a crash-course in motion design for the web

Motion design is a necessary skill for the modern web. With web animation really starting to hit its stride, everyone from UX designers to frontend developers needs an appreciation for what motion can add to their work.

Animated interactions are already commonplace in our native apps and operating systems. The web may be behind these platforms in its animation capabilities right now, but we're catching up fast thanks to the constant improvement of browsers' rendering and support of web animation options.

Soon the character and energy that motion brings to an interface will be the norm on the web too. Motion is starting to find its way into our web design process and being recognised as a valuable interaction design tool. These are exciting times!

While animation has a lot to offer in all aspects of design, I won't be going into too much detail on how animation supports UX here (I cover a few examples in this A List Apart article: netm.ag/UX-265). This article is all about developing an eye for motion and putting traditional animation principles into practice.

Great interface animation is useful, conveys information and does it with restraint and style. That's a tall order, but it's not out of reach. Restraint and style is where motion design skills come in. Well designed motion keeps



AUTHORS

VAL HEAD

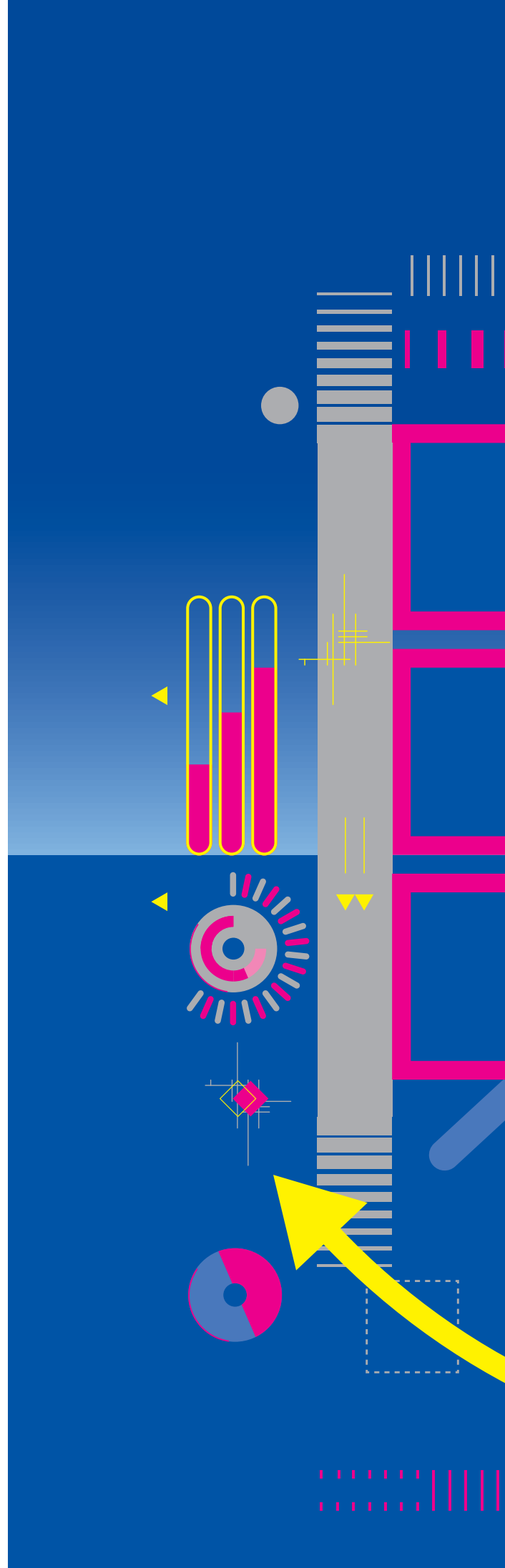
Designer Val is known for her work with web animation. She teaches workshops on interface animation, wrote the *CSS Animations* pocket guide and will be speaking at Generate New York in April valhead.com

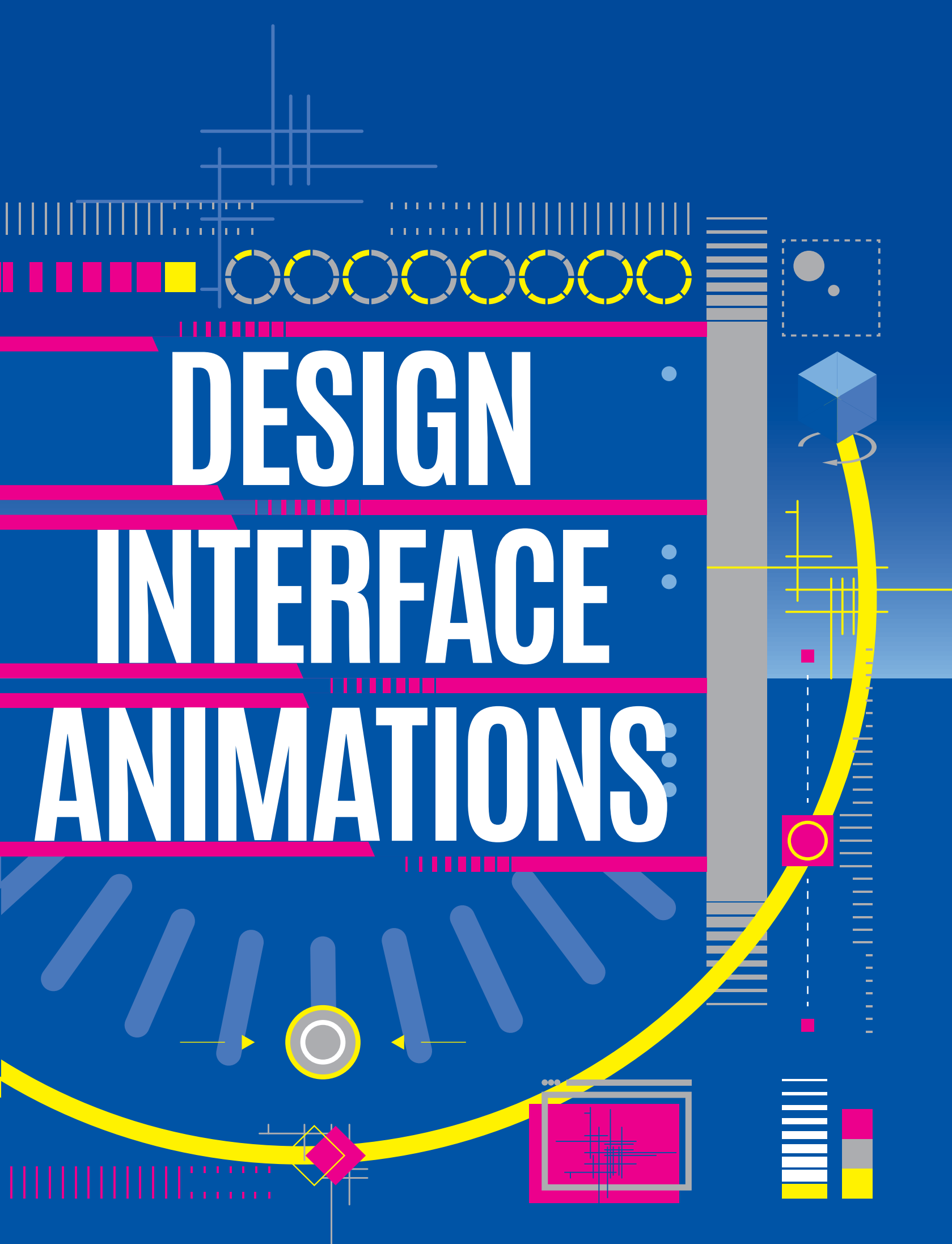


ILLUSTRATION

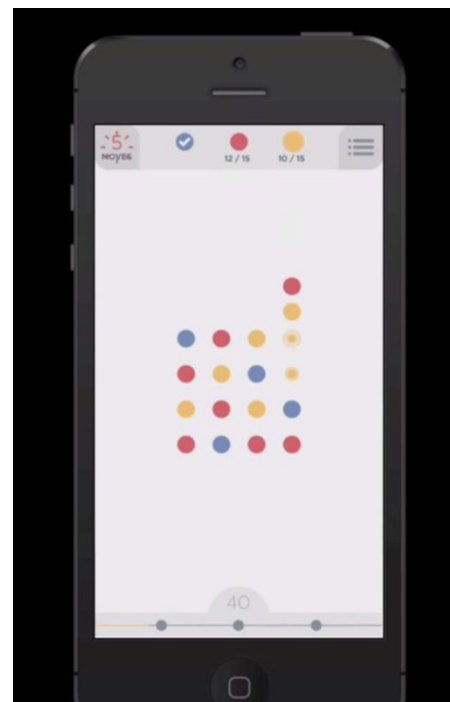
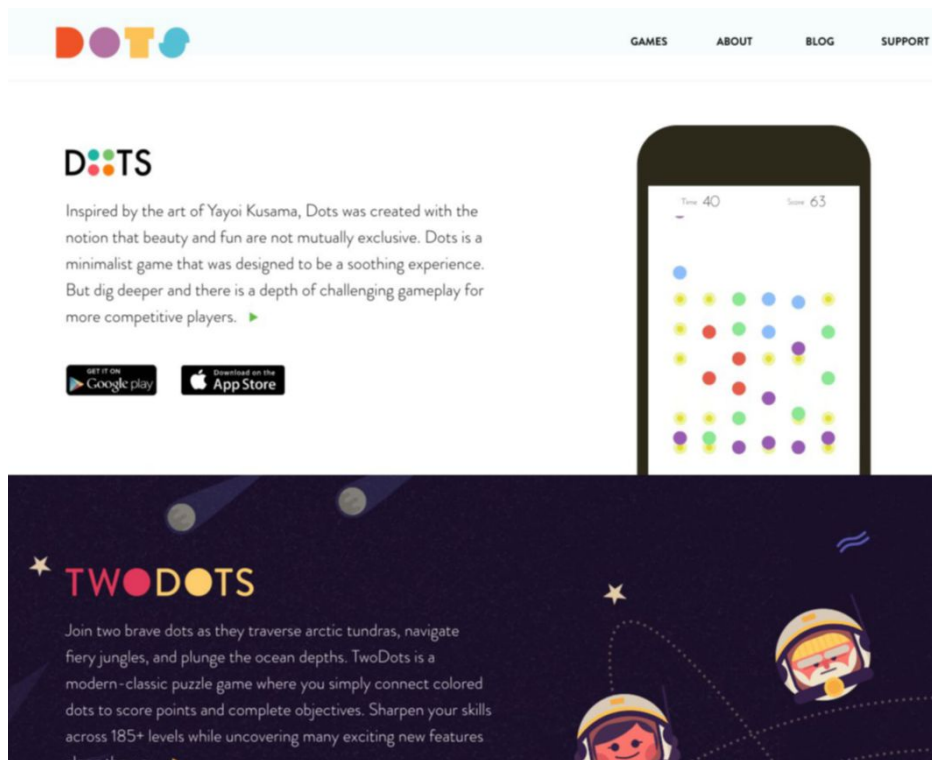
LUKE O'NEILL

Luke is a graphic designer and illustrator based in Bath. He is currently working as the art editor of *T3* magazine lukeoneill.co.uk





DESIGN INTERFACE ANIMATIONS



Bouncy The bouncy motion of the dots in Dots conveys an energetic playfulness and creates momentum

our audience focused on the quality experience instead of distracting them with awkward bells and whistles.

Classic animation principles

The bible of animation, if there were one, would be *The Illusion of Life* by Disney animators Ollie Johnston and Frank Thomas (netm.ag/illusion-265). This book features the 12 guidelines by which Disney imitated life in its animated films.

These principles are time-tested and even though they're written for an entirely different medium, we can apply them to animated interactions with great results. Learning to identify each of these principles will help you develop an eye for animation and give you a basis for evaluating and designing interactions. The 12 classic principles are: squash and stretch, anticipation, staging, straight ahead and pose to pose, follow through, slow in and slow out, arcs, secondary action, timing, exaggeration, solid drawing and appeal.

They don't all apply equally to our efforts in interface animation, but it's still helpful to know what each entails.

We'll take a closer look at the three principles that are particularly key to interface animations: timing, secondary action and follow through.

Timing & spacing: It really is everything

My improv teacher always tells us that timing is the key to comedy.

The Illusion of Life features the 12 guidelines by which Disney imitated life in its animated films. These principles are time-tested and we can apply them to animated interactions with great results

As it happens, timing is also the key to animation. In animation, timing is all about speed.

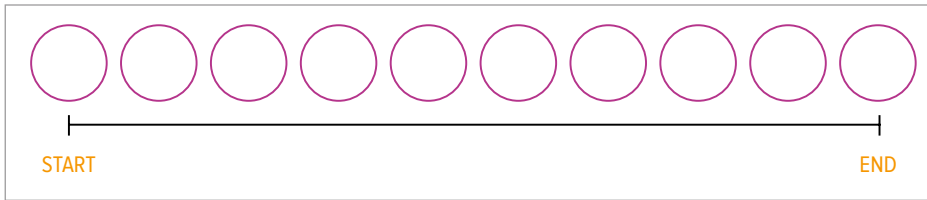
In the classic text, it's said that correct timing makes an object appear to obey the laws of physics. It gives cues as to the weight of an object and which forces have acted upon it. When it comes to interface animation, our goal isn't always to replicate the physical world, though. We tend to focus on the

aspect of timing that establishes an object's 'personality'. So much can be communicated through timing!

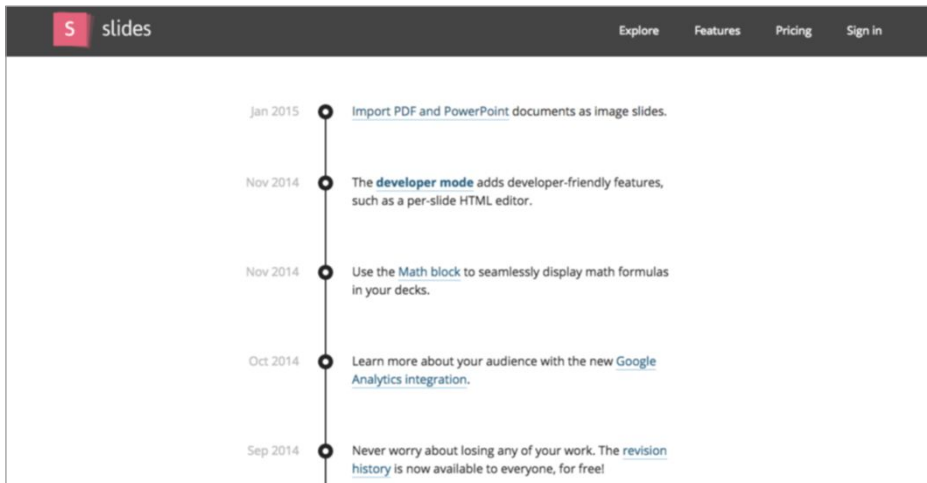
For web animation, spacing comes down to the easing (the timing function) that we apply to an animating property. Easing determines how speed changes occur across the duration of an animation. That's how we indicate mood

and personality. The duration of an animation also plays a role here, but the easing does most of the talking.

Strong bouncy timing, like the motion of the dots in the Dots game (weplaydots.com), conveys an energetic, playful feeling. It can often feel even a bit childish at times. Scroll down on the game's website for a short animation and look closely at the way the dots move – when they fall into place they



Linear easing The animating object moves the same distance in each frame, to give a steady speed



Slides Each of the items in the Slides timeline overshoots its destination then comes back, creating the follow through

bounce back up a little. The bounce is short, which informs us the dots have some weight to them.

At the other extreme, linear easing appears mechanical and lacks life. Linear motion holds the exact same constant speed across the entire duration of the motion; there's no slowing down or speeding up at all. It's pretty much impossible in the real world, thanks to things like gravity! Linear easing communicates nothing useful about the mass or nature of the moving object.

The funny thing about timing is that despite its potential to communicate, and all the effort we might devote to choosing it, all animations have to happen fast. One of the biggest motion design crimes out there is to make your UI animations too slow. It takes practice and iteration to get timing right. Prototyping animations is very effective for getting your timing down.

Secondary action: The supporting actor

Secondary action is additional motion that compliments, or occurs as a reaction

to, the primary motion. In traditional animation, this might be something like a character whistling or moving her arms around while she walks. In interfaces, it's how nearby elements move in reaction to the main motion.

Websites and apps can't whistle or move their arms, so the opportunities for secondary action aren't always as obvious. However, they do have related elements and elements that move together. Those are prime candidates for secondary action.

A good example is the 'Remember me' function in Stripe Checkout's payment flow (stripe.com/checkout – see overleaf for more on this). The expansion of the form is the primary action, and the additional form elements flipping down into view is the secondary action. They work together to gracefully expand the form and draw your attention to the additional options.

Follow through: Overshooting just a little

Follow through and overlapping action are two very closely related concepts that deal with how an object comes to

Timing functions

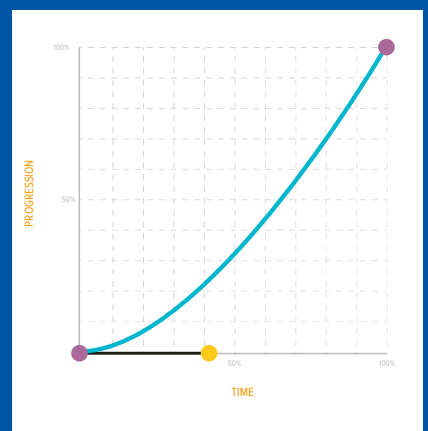
In CSS we have keywords such as `ease`, `ease-in`, `ease-out`, `ease-in-out` and `linear` to define the easing option for the `timing-function` property. On its own, this looks like a terribly restrictive list. Thankfully we have cubic Bézier functions to open up our easing options. These let us define nearly any easing we'd like to see.

Cubic Bézier functions are written as a list of four numbers, like so: `cubic-bezier(.25,.1,.25,1)`. That example is the cubic Bézier version of the `ease` keyword in CSS. They're not the friendliest looking things and it's difficult to infer the easing represented by the numbers.

Cubic Bézier functions can also be expressed graphically, as a curve. The numbers represents the points required to draw the curve, and it's much easier to read and edit them in graph form. These graphs plot the progression of the animating property against the time it takes to complete the animation. The curve represent the rate at which changes in the animating property occurs. Steep areas of the curve represent a faster rate of change, while flatter parts of the curve represent a slower rate of change.

[Cubic-bezier.com](https://cubic-bezier.com) and [Ceaser \(matthewlein.com/ceaser\)](https://ceaser.matthewlein.com/ceaser) let you create and customise cubic Bézier functions by manipulating motion curves. Ceaser also gives you additional presets for the popular Penner easing equations. I highly recommend these or other tools to expand your easing options.

For even more about cubic Béziars, this kirupa tutorial covers it all: netm.ag/kirupa-265.



Easing in The easing curve for the ease-in is flattest at the start, where rate of change is the slowest



Case Study Stripe Checkout

Stripe Checkout is a stellar example of web UI animation that's fully ingrained as part of the overall experience. I asked Michaël Villar of Stripe (pictured above) about the team's process.

Villar described the design process as having two main phases: wireframe-supported explanations of ideas, and simple prototypes that put the most promising ideas to the test. It's a delicate process. "Finding the right animations and transitions is an ongoing process, and one that takes time," explains Villar.

I brought up the subject of challenges specific to executing an animation-focused design on the web. The answer, unsurprisingly, was browser technology.

"We found endless bugs and glitches while trying to push the limits of the browsers to achieve smoother animations. And it still happens: with each browser update, things in Checkout can break," Villar says.

If you're using the latest technology, dedicating time to addressing browser issues is a necessary evil. However, Villar rightly points out that as web animation sees more use and interest, browser support issues are being resolved quickly. "Browsers will be required to become more stable and improve their capabilities," he suggests. "It's already happening."

Stripe primarily uses CSS transitions triggered by JavaScript for its checkout animations. There isn't a popular framework or library behind them, as the Stripe team found it saw better performance from lower-level options.

"If you can use CSS transitions or animations triggered by JavaScript, please do it," urges Villar. "If you need more control over animations, you can use `requestAnimationFrame`, but you'll have a performance drawback."

- ▶ a stop. Follow through is the motion of overshooting the final destination by a small amount and then coming back to settle into place.

In the Slides changelog timeline (slides.com/changelog), each item in the list shoots out a little further than its destination before settling back to a stop. That's follow through in action.

Similarly, overlapping action is the concept that not all parts of an object come to a stop at the same time. For

Putting it into practice

It's fun to read about these principles, but they're more useful when we put them into action. Let's take a stab at putting these techniques into practice with some CSS animation.

For this part, I'm assuming you have some background in CSS keyframe animation. If you need a refresher, this post by Rachel Cope will get you up to speed in no time: netm.ag/keyframe-265. Our example is an animated alert box

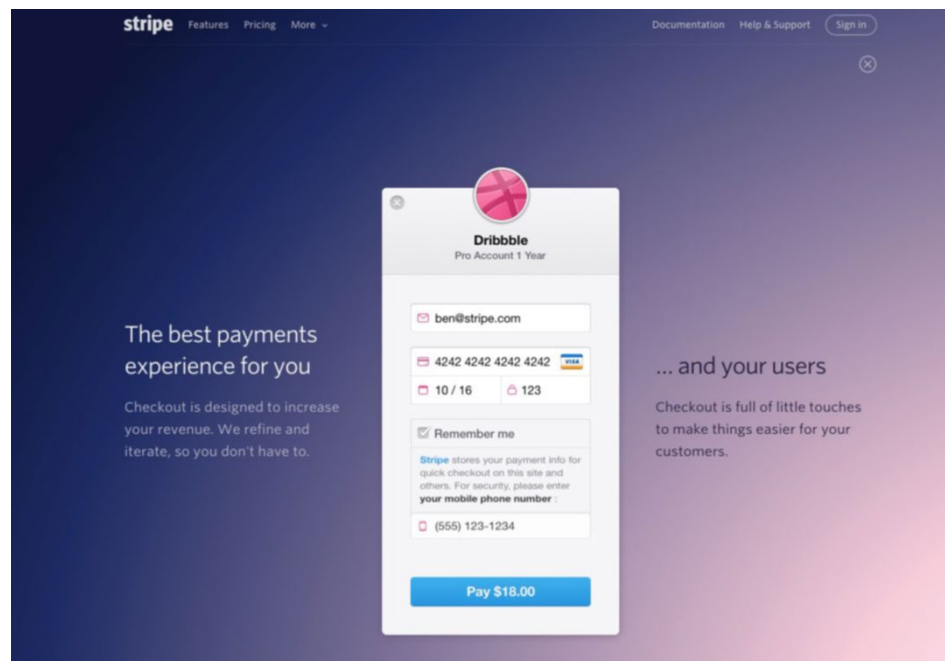
Unless you're working with some sort of physics engine, you'll be faking or approximating these concepts with easing choices or keyframe placement. There's nothing wrong with that

example, a dog's floppy ears keep moving forward even after their body has come to a stop.

Unless you're working with some sort of physics engine, you'll be faking or approximating these concepts with easing choices or keyframe placement. There's nothing wrong with that. Hinting at these familiar concepts with any type of animation goes a long way to creating a more realistic feeling.

that confirms your booking at a fictitious cat café. It animates onto the screen to let us know our booking task has successfully been completed.

See our starting point at netm.ag/cat-265. At the moment it's a bit, well, lacking. Our alert box does the bare minimum: it animates into view, followed by the associated button, which fades in below it. There's nothing all that compelling about it ... at least not yet.



Stripe checkout The 3D rotation part of the form-expanding animation in the Checkout flow is an example of secondary

A timing check

Timing is always a good one to start with. Our alert box is using the ease-out timing function, so it comes in at a higher speed and then slows into place in a low-key kind of way. Not bad, but it's still a little lacklustre considering the task at hand.

This is the last step in our transaction. We've just finished our task and booked something fun and exciting (at least, if you like cats). A little more energy and excitement is in order for this situation! A change to our easing will help take care of that.

We'll keep the general feel of an `ease-out`, but we'll amp it up with a custom cubic Bézier function created on cubic-bezier.com. We'll have our new easing shoot out past the end point and then snap back into place.

Our new animation now reads:

```
animation: slideIn .85s cubic-bezier(0.175,
0.885, 0.320, 1.275) both, fadeIn 0.25s ease-
in both;
```

With that change we've accomplished two things: We've created follow through action by having our box overshoot its destination. We've made the motion feel more energetic by using a curve with more drastic speed changes. See our example now: netm.ag/cat2-265.

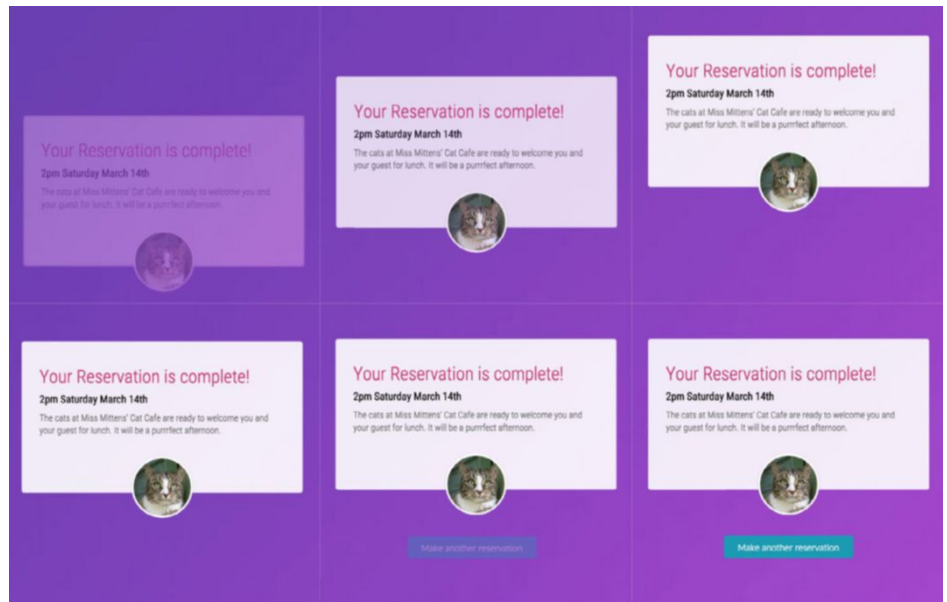
It's still too slow, but we'll address that at the end.

Some secondary action

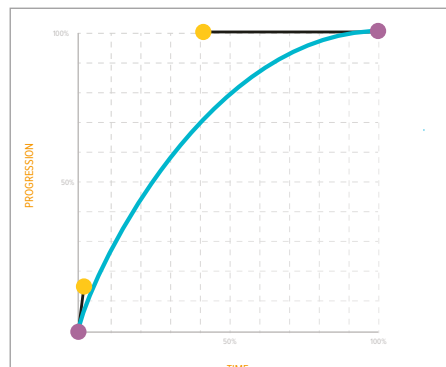
Our button is a prime candidate for some secondary action. It's related to our main alert box, and it can appear slightly afterwards. Its delayed fade-in hints at some secondary action, but we could create a more dramatic effect by having it slide out from under the body of the alert box, as if it's sliding down into place as a reaction to the alert box's upward motion.

To accomplish this, we'll add one set of keyframes for that slide down action:

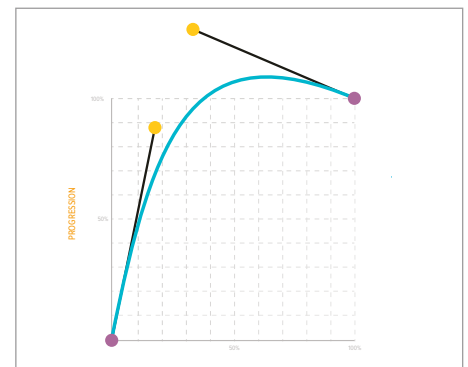
```
@keyframes slideDown {
  from {transform: translateY(-120px)}
  to {transform: translateY(0)}
}
```



Basic motion To start with, everything in our example moves in and animates at once, like one solid connected object



Ease out This is the easing our example starts with, using the ease-out keyword in CSS



Follow through Contrast this with our ease-out easing. The curve extends past the top, creating the follow through

Add that animation to our button in addition to its fading in, with slight delays on both so they happen when the main motion has mostly completed:

```
button {
  animation: slideDown .425s .55s cubic-
    bezier(.03,.16,.39,0.99); both, fadeIn .6s .5s
    cubic-bezier(0.550, 0.085, 0.680, 0.530) both;
}
```

It's already looking like a much more sophisticated and energetic animation!

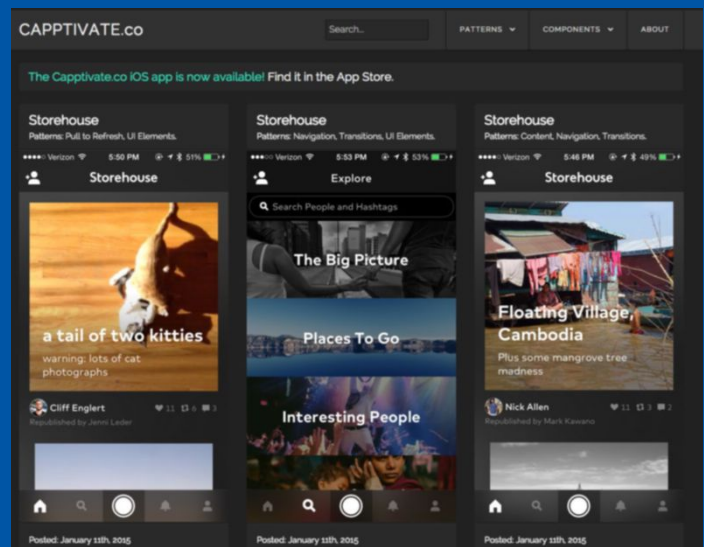
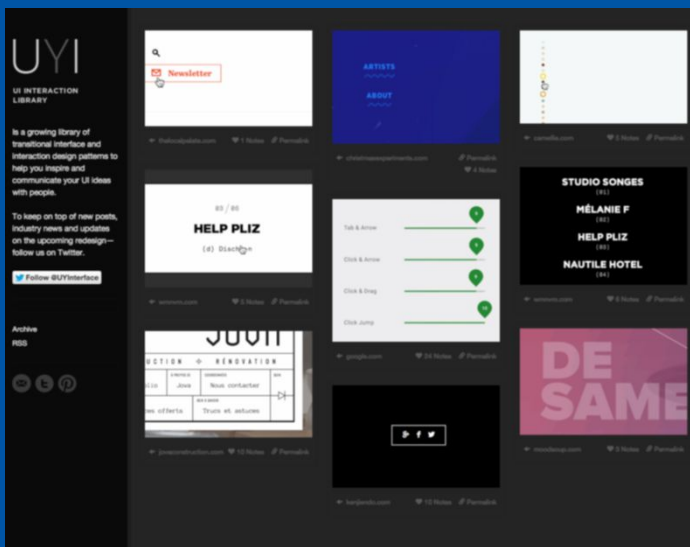
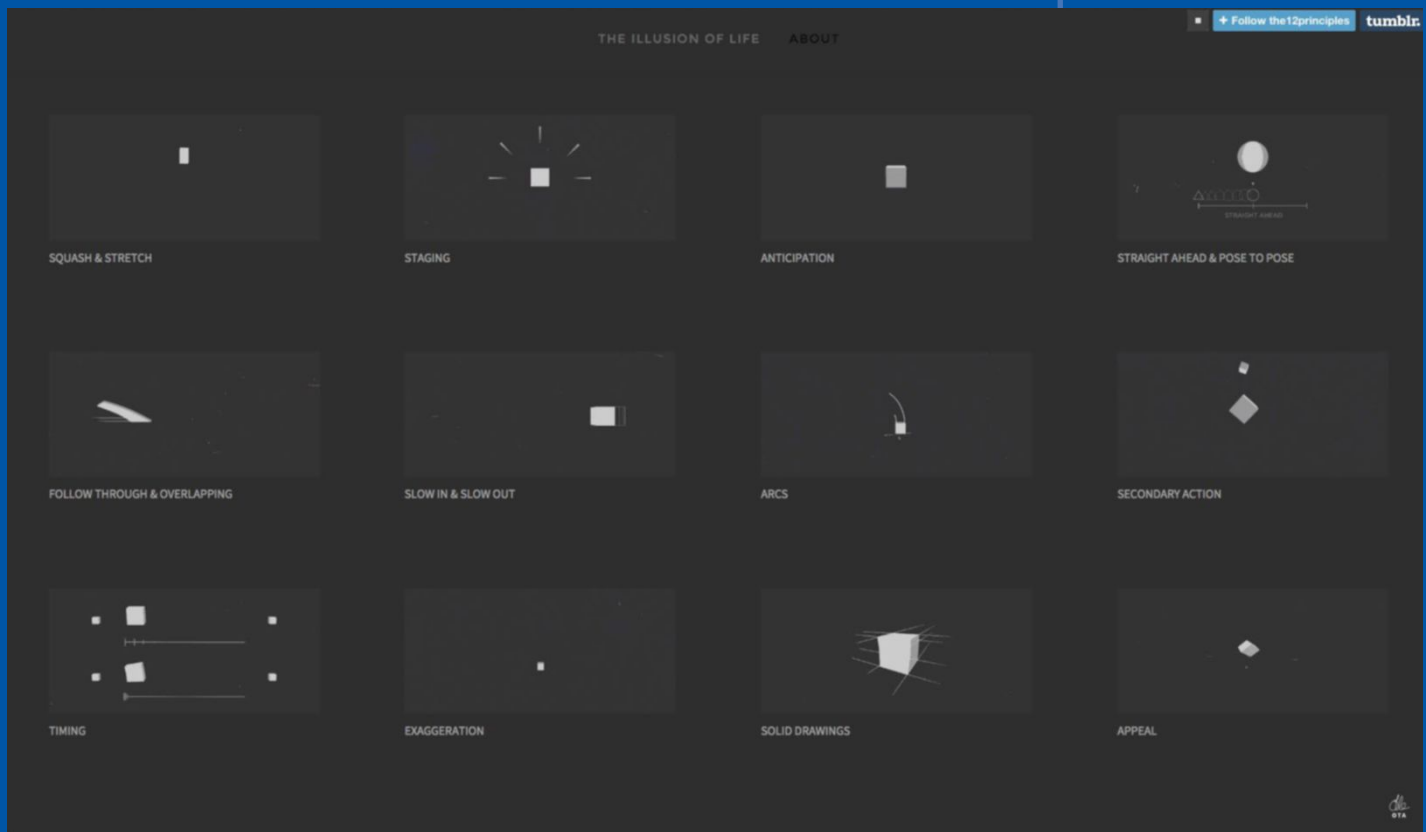
Adding some overlap

All of the content within our alert box is moving at the same rate, like it's a flat piece of glass with the text etched onto it. This doesn't fit with our goal

of creating an energetic, fun mood with the motion. Animating the text inside the box separately will create some overlapping action to give the motion more life and create the effect of energy transferring from one element to another.

To accomplish this, I'll add one more set of `keyframes` for a less pronounced slide in. I'll apply these to the `h2`, `h3` and the paragraph inside the box, each with a delay. The new set of keyframes is a shortened version of our `slideIn` animation:

```
@keyframes slideInShort {
  from {transform: translateY(80px);}
  to {transform: translateY(0);}
}
```



Resources

Adding motion

Recommended reads on adding meaningful motion to interfaces:

- 'Provide meaning with motion' by Paul Stamatiou (netm.ag/stamatiou-265)
- 'UI animation and UX: A not so secret friendship' by Val Head (netm.ag/head-265)
- 'Transitional Interfaces' by Pasquale D'Silva (netm.ag/dsilva-265)

Traditional principles

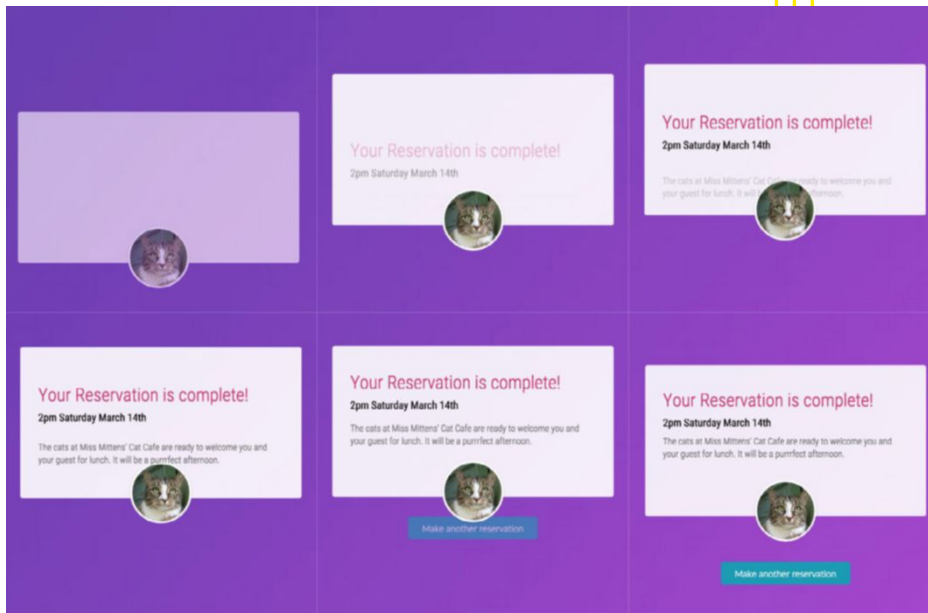
These are some good starting points for your own research into traditional animation principles:

- *The illusion of life: Disney animation* by Ollie Johnston and Frank Thomas (netm.ag/illusion-265) – The classic text referred to by many in the industry
- *Illusion of life Tumblr* (the12principles.tumblr.com) – The book above summarised in video and Tumblr form

Galleries

These are a great place to explore inspiration and trends in UI animation:

- *Art of The Title* (artofthetitle.com) – It's not UI, but title designs are wonderful inspiration
- *Hoverstat.es* (hoverstat.es) – A gallery celebrating great interaction design and frontend development
- *Use Your Interface* (useyourinterface.com) – A library of transitional interface design patterns



Left In our final version, the alert box container, text content and button animate in with complimentary motion

Below One of my favourite sources of motion design inspiration! Art of the Title features breakdowns and case studies galore



- All three elements are assigned that animation with varying delays:

```
animation: slideInShort 0.3s cubic-bezier(.03,.16,.39,0.99); both, fadeIn 0.15s cubic-bezier(0.550, 0.085, 0.680, 0.530) both;
```

Our example is really starting to shape up now: netm.ag/cat3-265.

Sass variables to manage delays and durations

Sass can save you some headaches when it comes to adjusting related durations and delays. I like to set my related durations and delays relative to a global Sass variable – like `$dur:.6s`, for example – then multiply that variable as needed for related delays and durations. It's a huge time-saver.

Final touches and speeding the whole thing up

We tend to keep animations slower than they need to be while we're designing them. And for good reason: we need to see what's happening in order to make our design decisions.

It takes much less time to 'read' an animation than it does to design it, though. Our eyes and brains work very quickly when reading motion, so speeding up our animations is almost always necessary – sometimes as

drastically as half the speed. Don't be shy in chopping these durations down.

To finish off our example, we'll cut down the durations and adjust the delays accordingly. Optionally, we can also add in some Sass variables for the cubic Bézier values and durations to tidy things up. See our example in its final state here: netm.ag/cat4-265.

After those few tweaks, our alert box animation is looking much more

We're no longer looking for ways to justify why animation should be there. We're instead looking for ways to create the kind of interface animations that are designed with purpose and style

polished. All the motion involved has been aligned to the message we wanted to convey, using a few of the classic animation principles.

These techniques, along with the other eight in the list, can be applied to nearly any web animation task. The more we put them into practice, the better our motion design skills will become.

Is 2015 the year of web animation?

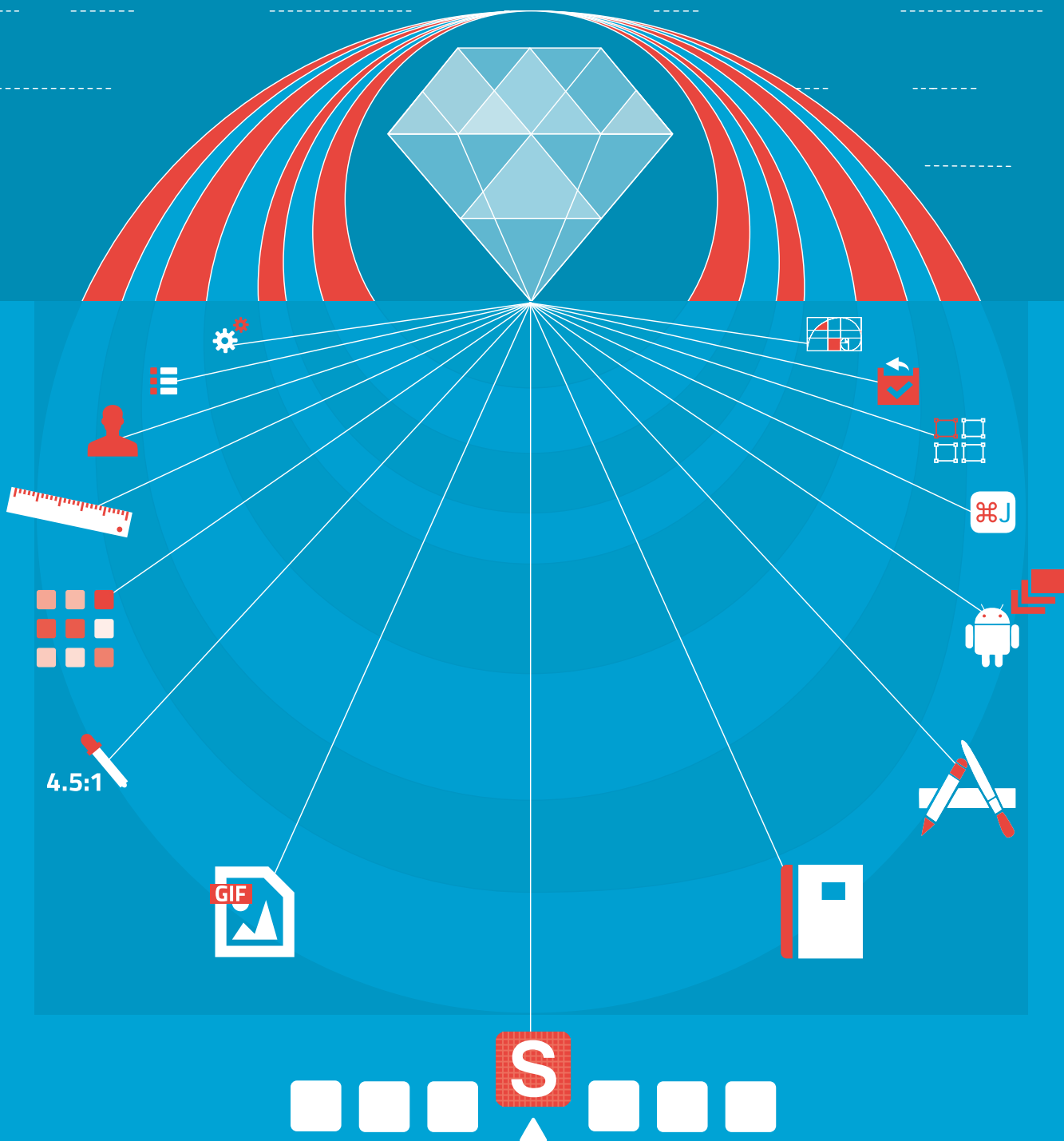
Many of the 'Web design trends for 2015' lists have included motion as something

that's on the rise. I wholeheartedly agree with anyone putting animation on their list. Browsers are getting faster and more consistent with every new web animation technology that emerges. This is a big part of why web animation is starting to really capture the attention of designers.

It's not the only reason though – I've also noticed a change in the industry's attitude towards animation.

At conferences and workshops, I'm noticing that the most common questions I'm being asked are starting to change from 'Why should I bother?' to 'How can I use this well?'

We're no longer looking for ways to justify why animation should be there. Instead, we're looking for ways to do it well. To create interface animations with purpose and style. High fives all round for that! There are a lot of talented web designers out there and I'm excited to see what you do with animation. **n**



15 awesome Sketch plugins

Rafael Conde walks you through 15 of his favourite Sketch plugins, where and how you can get them, and how to make the most of them

Sketch is becoming more and more popular amongst designers and developers as their web and UI design tool of choice.

What some may not know is that there is a diverse and powerful community of people working to extend the functionality and features of Sketch by building custom plugins. In this article, I will run down some of my favourites.

1 SKETCH TOOLBOX

sketchtoolbox.com

Sketch plugins are scattered all around the web, mostly on GitHub, and it can be very hard to discover them. Thankfully, Shahruz Shaukat decided to create a great little Mac app that lets you search, install and update all your plugins. It's called Sketch Toolbox and it's very simple to use – just search for a plugin and hit install.

Done. If you want, you can also click on 'View on GitHub' to check out the release notes and specific instructions.

2 CONTENT GENERATOR

netm.ag/contentgenerator-265

This is the plugin that made me realise the true potential of plugins. Built by Timur Carpeev, this tool lets you generate random content, whether that be people's names, addresses, profile pictures, background photos – you name it. The way it works is simple: create a shape (for images) or a text block, select it, go over to the plugins menu bar, run Content Generator, and choose from a variety of options for the kind of content you would like to see.

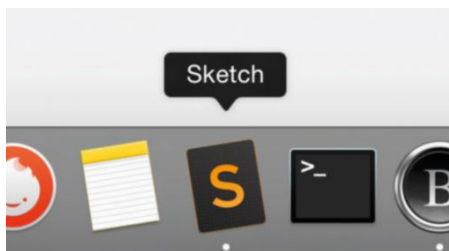
This is extremely useful for populating designs. For example, to quickly mock-up a friends list on an app, you could create a



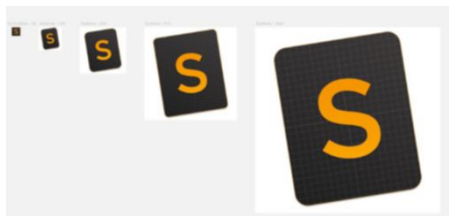
AUTHOR

RAFAEL CONDE

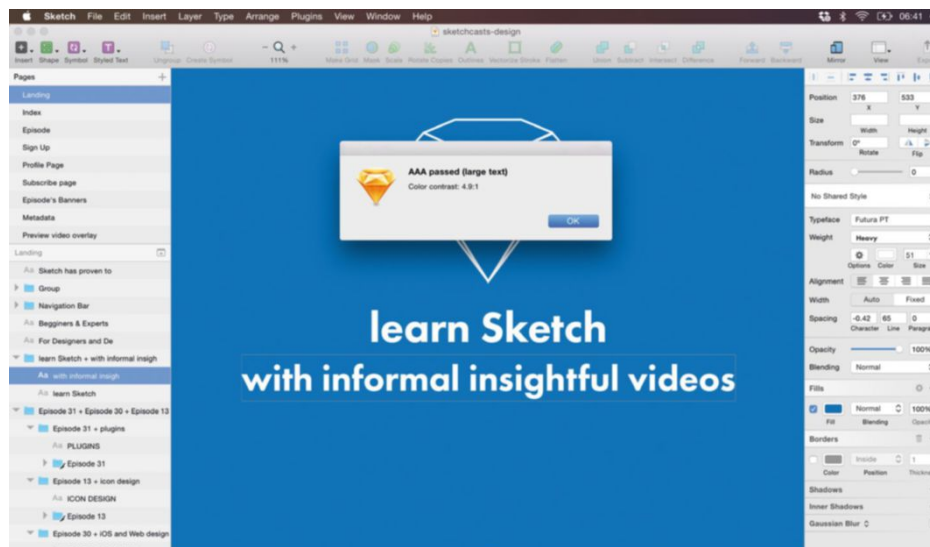
Rafael is a designer and developer at Imaginary Cloud. He co-founded SketchCasts, a series of weekly screencasts exploring Sketch rafaelconde.net



Sketch Dock Preview Preview your work on the OS X Dock



Generate ICNS Create ICNS files quickly and simply



Color Contrast Analyser Find out if your colour combinations meet MCAG guidelines with this plugin

- ▶ grid with circles and a label below, select them and, with this plugin, generate profile pictures and names in seconds.

3 GENERATE ICNS

netm.ag/generateicns-265

Built by Nathan Rutzky, this plugin does one thing and one thing well. Sketch offers a pretty handsome number of export file formats – PNG, JPG, SVG and so on – but if you are designing icons you will probably have to create an ICNS file. This is basically a bundle of different sized images. There are some good apps that do this well, but with this plugin you won't have to leave Sketch.

You can either create a single 1024 x 1024 icon, and the plugin will scale it down automatically, or you can create an artboard for each size, in which case the plugin will simply bundle them together. I recommend starting your project using an iOS or Mac app icon template (these come built-in with Sketch). That way you already have the right sized artboards.

4 SKETCH DOCK PREVIEW

netm.ag/dockpreview-265

This is a great utility if you are working on a Mac app icon – a simple `shift+cmd+D` will preview your current artboard on

the OS X Dock, replacing the Sketch gem. Useless if you are working on a web page or an app, invaluable if you are working on icons.

5 SWATCHES

github.com/jodyheavener/Swatches

Swatches is a plugin that will generate a palette of colour swatches for you. That's it, and that's the beauty of it. Run the plugin from the plugins menu bar, and type in the HEX values of the colours you want to use. The plugin will automatically create a grid with the colour itself, a label, HEX and RGB values.

6 COLOR CONTRAST ANALYSER

netm.ag/colorcontrast-265

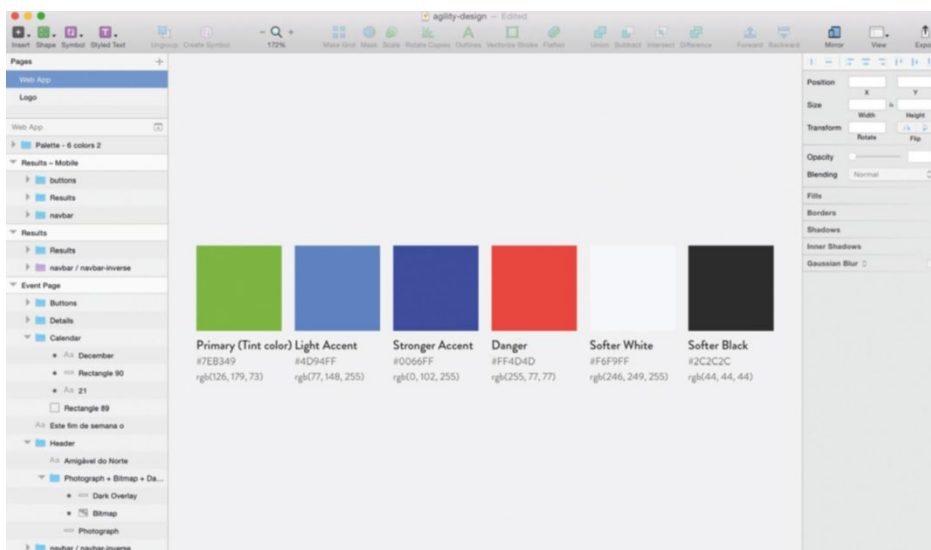
Florian Schulz created this nifty utility that will calculate the colour contrast of two layers, and evaluate this against the Web Content Accessibility Guidelines (WCAG). It's indispensable if you value accessibility, legibility and all-round good design.

7 SKETCH DYNAMIC BUTTON

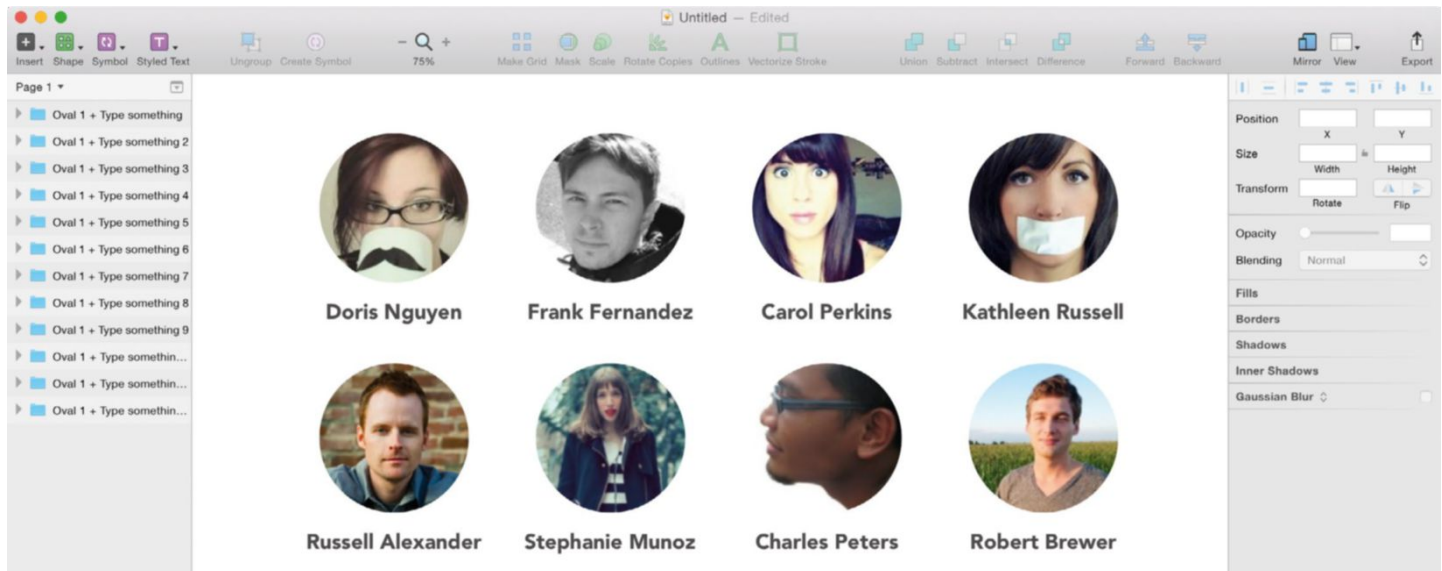
netm.ag/dynamicbutton-265

This was the first plugin I saw, and it made me realise the potential of them. Sketch Dynamic Button allows you to create buttons with a fixed padding, no matter how long the text is – just like you would with CSS.

Here's how it works. You create a text block and press `cmd+J`. The plugin then



Swatches Type in the HEX values of the colours you want to use and this plugin will generate a palette of swatches



Content generator Generate random placeholder content to populate your designs

creates a group with your text block, a shape for the structure or background of your button, and renames the text block to '0:0:0:0'. These values are the padding values for your button, exactly like CSS's syntax.

So you can rename this layer to something like '10:20:10:20' and your button will have 10px padding on the top and bottom, and 20px left and right. If you change the text of the text block,

Sketch Dynamic Button allows you to create buttons with a fixed padding, no matter how long the text is, just like you would with CSS

all you need to do it hit the keyboard command again, and it will automatically update the shape surrounding it.

8 GENERATE GIF

github.com/NathanRutzky/Generate-GIF

It doesn't matter how you pronounce it, GIFs have been a part of the web since the 90s, and despite the disbelief of a lot of tech-savvy people, it looks like they are here to stay.

But GIFs can be more than a silent, animated video of a funny cat; they

can be used to quickly and effortlessly prototype an animation or transition. This plugin eliminates the need to jump into After Effects or some other powerful tool if you want to create a quick prototype of an animation.

Create the desired animation, frame by frame, with an artboard for each, naming them 'Frame 1', 'Frame 2' and so on, and activate the plugin to create an animated GIF. You even have the option to set the time interval between frames or to loop the animation.

9 SKETCHSQUARES

github.com/abynim/SketchSquares

Recently there was an article entitled 'Design Tools at Instagram' (netm.ag/tools-265) written by one of the company's designers. In this, the designer shared a simple tool that enabled users to automatically generate a random Instagram photo in Photoshop. It didn't take long for Aby Nimbalkar to port that same tool to Sketch.

Similarly to the Content Generator plugin, with SketchSquares you start by creating a layer that you want to replace with a photo, and run the plugin. You can select from a variety of options, such as the source (your own feed or the 'Popular' page, for example), the preferred size, and even if you want to either replace the shape with the new bitmap photo or use the photo to fill the shape. This final

TOP TIPS PLUGIN SHORTCUT

Sometimes you find yourself using the same plugin over and over again. For example, you might want to add a distance between a lot of different elements in a project. Heading over to the menu bar, travelling through the menus and selecting the right command, again and again, can get old pretty fast.

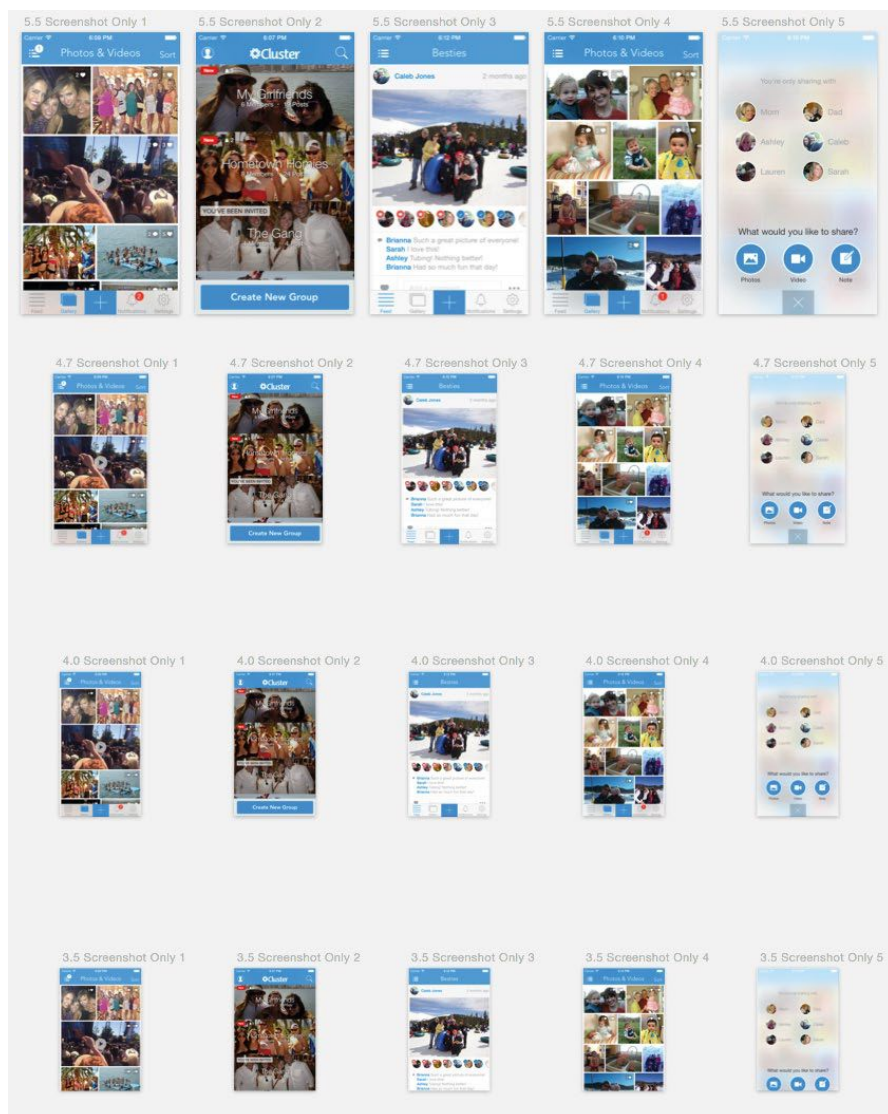
Bohemian Coding – the company behind Sketch – knows this, so it's created a built-in command that enables users to run the previous plugin. Just use the shortcut **control+shift+R** and voilà.

So, returning to the example of Sketch Measure, you just need to run the plugin once. After that, you can simply select two elements and use the keyboard shortcut above. What a time-saver.

CREATE YOUR OWN

If you feel inspired, and you know your way around code, you could try creating your own custom plugin. Sketch plugins are written in CocoaScript, which is a way of calling Cocoa via JavaScript. If you want to play around with it, click on 'Plugins' in the menu bar, select the option 'Custom Plugin...', and type in your script.

To find out more and get started on your first plugin, visit the official support page at netm.ag/dev-265. Happy hacking!



Sketch to App Store This superhero plugin creates and exports all the screenshots you need for the App Store

EXCLUSIVE SKETCHCASTS OFFER

If you would like to know more about Sketch, or if you've already mastered the tool but are curious about new plugins or the lesser-known details of the app, take a look at SketchCasts (sketchcasts.net).

SketchCasts are weekly video tutorials covering everything you'd ever want to know about this great design tool. There are screencasts aimed at everyone from beginners to experts, covering topics such as 'Optimising performance' and 'Long Shadows Design'. If what you've read in

this article has piqued your interest, there are also runthroughs of most of these plugins in action, using real-life examples.

SketchCasts is a paid service (normally just \$8 a month). However, exclusively for net magazine readers, we're offering one month's membership completely free – simply visit sketchcasts.net/netmag to redeem the offer (valid until May 31 2015). I'll see you there!

FREE
ONE-MONTH
SUBSCRIPTION
sketchcasts.net/netmag

▶ option is especially handy when dealing with round shapes, for example.

10 GENERATE ANDROID ASSETS

netm.ag/androidassets-265

If I have to be completely honest, I never really understood all of the different resolutions and pixel densities of Android. Gladly I never really had to, and it's probably this plugin's fault.

Design once, activate the plugin, choose which pixel density you've used (usually MDPI) and this plugin will automatically export your work in MDPI, HDPI, xHDPI, xxHDPI and xxxHDPI. Designers rejoice!

11 SKETCH TO APP STORE

github.com/clusterinc/SketchToAppStore

This plugin got a lot of exposure when it came out, mostly because it's so brilliant. If you design or develop for iOS, you

To be honest, I never really understood all the different resolutions and pixel densities of Android. Gladly I never really had to, and it's probably Generate Android Assets' fault

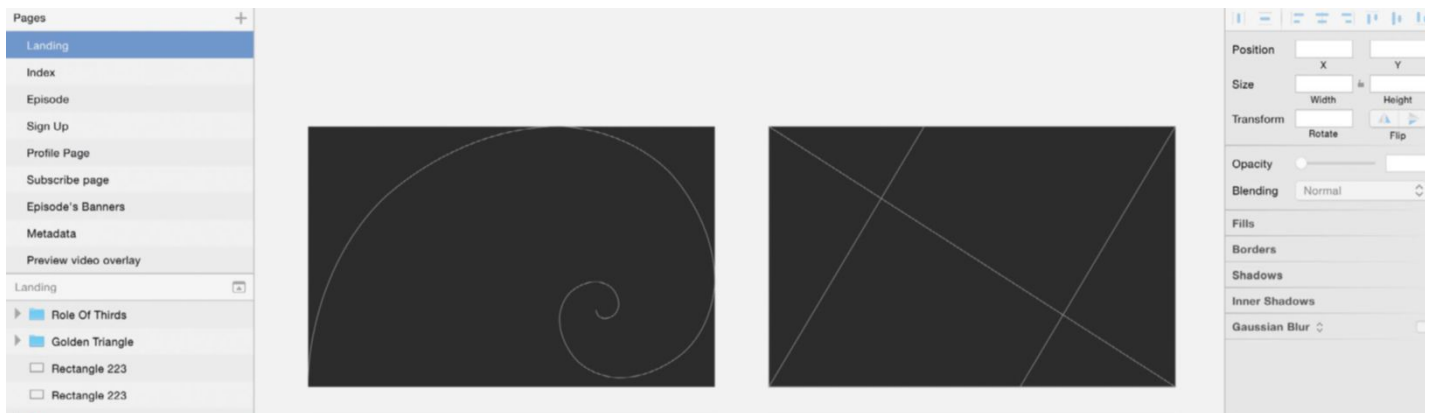
probably are familiar with the pain of creating a range of screenshots for the App Store, especially now there are two new iPhone screen sizes.

What this plugin does is take your screenshot, create a simple but completely customisable template with an iPhone and text on top, and export 45 screenshot images: a set of images with the iPhone and text, and a set with just the screenshot (and an extra Android one), all in JPG format and ready to upload to iTunes Connect. Just read that last sentence again – I know!

12 SKETCH NOTEBOOK

netm.ag/notebook-265

When it comes to presenting your designs to a client or co-worker, sometimes it's nice to explain the thinking behind it. This plugin will add a tasteful sidebar



Sketch Divine Proportions See examples of golden spirals or golden ratio grids to help guide your design

to the right of your document. You just have to select an element of the project, hit [ctrl+alt+cmd+9](#) and type your comment. The plugin will add the appropriate number and respective comment in the sidebar.

13 SKETCH MEASURE

[github.com/utom/sketch-measure](#)

If you work alongside other people, especially developers, it's great if you can deliver your final mockups with some specs overlaid – things like the distance between elements, the dimensions of those icons, the HEX code of the colour you are using, or the font of a label for example.

If this sounds familiar to you, Sketch Measure will make your life easier. With a couple of clicks of your mouse, you can automatically create overlays on your design that contain this kind of information – all in the most unobtrusive way possible, and easily hidden.

14 DIVINE PROPORTIONS

[netm.ag/divineproportions-265](#)

Designers love grids. They love logic behind emotion, and divine proportions are just that – divine. This plugin takes a shape and generates, for example, an overlaid golden spiral ([netm.ag/spiral-265](#)), or a grid based on the sections created by the golden spiral, or it divides it by the rule of thirds. You name it. For me, it's a fundamental tool when it comes to layout work.

15 SEND TO SLACK

[github.com/shahruz/Send-to-Slack](#)

If you use Slack as a communication tool on your team, you are probably tired of exporting assets and artboards from Sketch, finding the files, and sending them through Slack. If you work in a medium-to-large company as a designer, this should sound very familiar.

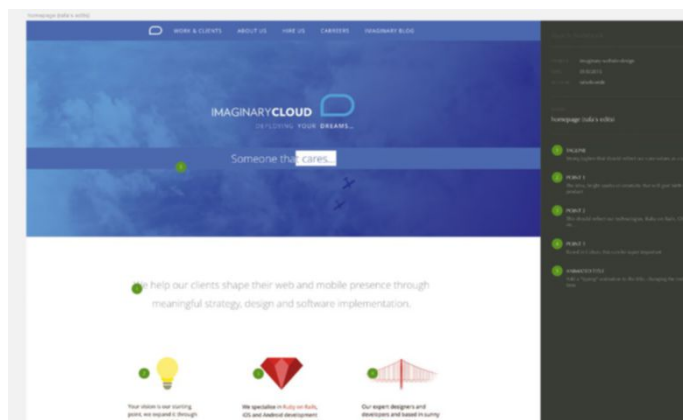
This great little utility allows you to share artboards to specific Slack groups,

channels or users, directly through Sketch's menu bar. Select any number of artboards, go to [Sketch > Plugins > Send to Slack](#) and choose whether you want to share to a group or a channel – and you are done! A great time saver.

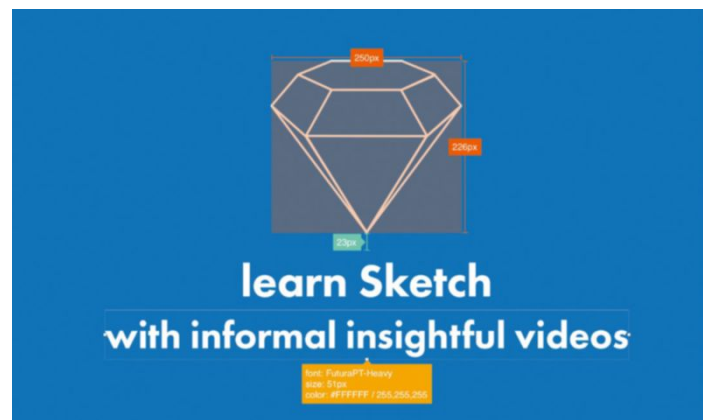
SKETCH: STREAMLINED

One of the great things about Sketch is the passionate community around it. From blogs to tutorials to resources to Slack teams dedicated just to discussing this design tool, Sketch's users are super-responsive when it comes to improving the app, and the community dedicated to building custom plugins is growing every single day.

These 15 plugins allow me to push the functionality of this app to a whole new level, and they are just a small glimpse of what is out there and what is to come. Bohemian Coding is dedicated to expanding what the plugins can do, so the future is looking even brighter. [n](#)



Sketch Notebook Include comments for your client in a tasteful sidebar



Sketch Measure Add overlays with useful information to your designs

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PROJECTS

Tips, tricks
& techniques

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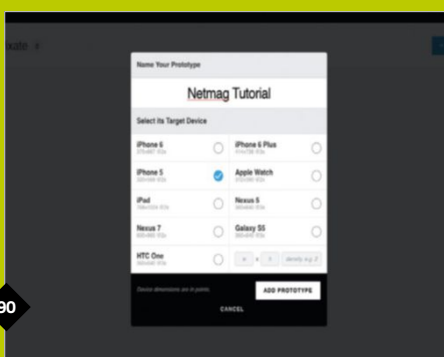
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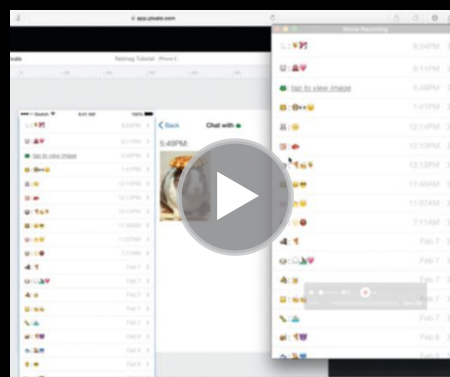
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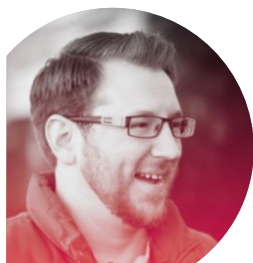
BROWSER SUPPORT

We feel it's important to inform our readers which browsers the technologies covered in our tutorials work with. Our browser support info is inspired by @andismith's excellent When Can I Use web widget (andismith.github.io/caniuse-widget). It explains from which version of each browser the features discussed are supported.



EXCLUSIVE VIDEOS

Look out for the video icon throughout our tutorials. This issue, four authors have created exclusive screencasts to complement their articles and enhance your learning, including James Steinbach's guide to switching from CSS to Sass in WordPress, and Jon Bell's tutorial on prototyping with Pixate.



ABOUT THE AUTHOR

JAMES STEINBACH

w: jamessteinbach.com/blog

t: @jdsteinbach

job: Frontend architect

areas of expertise:

Sass, CSS animation,
RWD, WordPress

**q: what's the best thing
on your desk today?**

a: A ham sandwich with
green chile cheddar cheese



*WORDPRESS

SWITCH FROM CSS TO SASS IN WORDPRESS

James Steinbach shows you how to combine WordPress and Sass to organise your code and streamline your workflow



VIDEO

James Steinbach has created an exclusive screencast to go with this tutorial. Watch along at netm.ag/wordpress-265. You'll find the gist at netm.ag/gist-265

> Every good developer knows to look for ways to reduce repetitious work and let their computer handle mundane, mindless tasks. CSS preprocessors like Sass give us several valuable tools to help automate the frontend coding process. For example, with Sass we can use variables. So instead of running a 'find and replace' command through a long CSS file to tweak a colour value, we can simply change the variable definition.

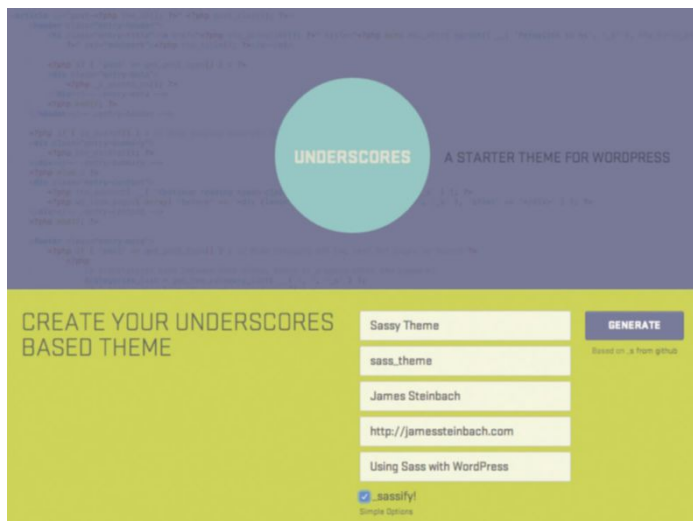
Sass also allows us to write functions to generate blocks of repeated style code. For example, a `button` function could accept the colour or style as a parameter and generate all the standard CSS for a site's button UI: border radius, gradients, text

colours and so on. We can also break up our giant stylesheets into organised modules. Nearly every CMS, plugin and web app uses directories and partials to improve code maintainability: Sass allows us to do this with our CSS.

The techniques explained in this tutorial are specific to Sass using the SCSS syntax (netm.ag/syntax-265), but they are applicable to most other preprocessors – like Less (lesscss.org) or Stylus (learnboost.github.io/stylus) – as well.

CONVERTING THEME STYLESHEETS

If the WordPress theme you're using has Sass files included already, the process of converting existing



Theme time The Underscores WordPress theme offers an option for users to download a version of the theme that includes Sass partials already

theme stylesheets to Sass is done for you. I typically start new themes with the Underscores template from Automattic (underscores.me). When creating a new theme package from its website, you'll find a '_sassify!' option if you click the 'Advanced Options' link. This will provide Automattic's default Sass library for you when you download the blank theme.

If the theme you're building or modifying doesn't include Sass files, however, you'll begin by converting the existing CSS file to Sass. This step reveals a major advantage to using Sass (SCSS): the Sass compiler reads plain CSS with no trouble at all. All you need to do to use the original `style.css` as Sass is to duplicate it and rename it `style.scss`.

SETTING UP SASS PARTIALS

Earlier I mentioned that Sass improves our workflow by letting us break thousands of lines of CSS into modular files called partials. Let's work through this step before getting to compiler methods.

If you've converted an existing CSS file to Sass, all you've got so far is a `.scss` file that's just as unwieldy as the CSS file it came from. At this point, you can start using variables and writing mixins or functions, but the Sass isn't modular or organised yet. You want to group your CSS file into sections that serve individual purposes. The goal is to be able to work out where code is found based on its file name.

Some modules of code that you'll probably want to isolate include navigation, typographic styles, sidebar widgets, footer and a grid system (although that list is not comprehensive by any means, it's just a starting point).

You will then cut and paste each modular section of CSS into its own Sass partial. A Sass partial's file name always starts with an underscore (`_`).

★ FOCUS ON

COMPILING SASS WITH COMPASS

+ Compass (compass-style.org) makes Sass configuration simple by storing output configuration in the `config.rb` file:

```
# Set this to the root of your project when deployed:
http_path = "/"

css_dir = "../"
sass_dir = ""
images_dir = "../images"
javascripts_dir = "../js"

# You can select your preferred output style here (can be overridden via the command line):
# output_style = :expanded or :nested or :compact or :compressed
output_style = :expanded

# To disable debugging comments that display the original location of your selectors. Uncomment:
# line_comments = false
```

I keep `config.rb` in my `scss` folder. In this file, the first five options are file path and directory values. The first option (`http_path`) is the project's path on the server. Next, `css_dir` specifies the directory where compiled CSS files should be saved. In this case, it's up one level from `config.rb` in `\scss\`. The `sass_dir` option points to the directory where Sass files are found (same as `config.rb` here).

The `images_dir` and `javascripts_dir` values specify where images and JS files are kept in this project. The `output_style` option controls how the compiler generates CSS. I toggle between `:expanded` for development and `:compressed` for production. Once we save all the project options in `config.rb`, all we need to do is navigate to the folder that contains that file and run `compass watch` in Terminal or Command Line. Compass uses all the options in the config file and runs Sass to compile our `.scss` files properly.



Mastering Compass Using Compass with a `config.rb` makes it easy to store Sass configuration options and share them with other developers

- This tells compilers not to create a unique CSS file based on this Sass file.

A compiler app that watches a folder full of Sass and automatically generates CSS will create `style.css` based on `style.scss`, but it won't create `navigation.css` based on `_navigation.scss`. To compile all the partials you've just created, you'll `@import` them in your main Sass file.

Each time you copy a block of code to a partial, replace it in the primary `.scss` file with `@import 'partial-name';`. If you move your footer styles to `_footer.scss`, add `@import 'footer';`. Don't include the `_` or the `.scss` in the import: just the name of the file.

If you want to get really organised and break header navigation and footer navigation into two separate partials in a `/navigation/` folder, include the folder name in the import:

```
@import 'navigation/header-nav'; // imports /navigation/_
header-nav.scss
@import 'navigation/footer-nav'; // imports /navigation/_
footer-nav.scss
```

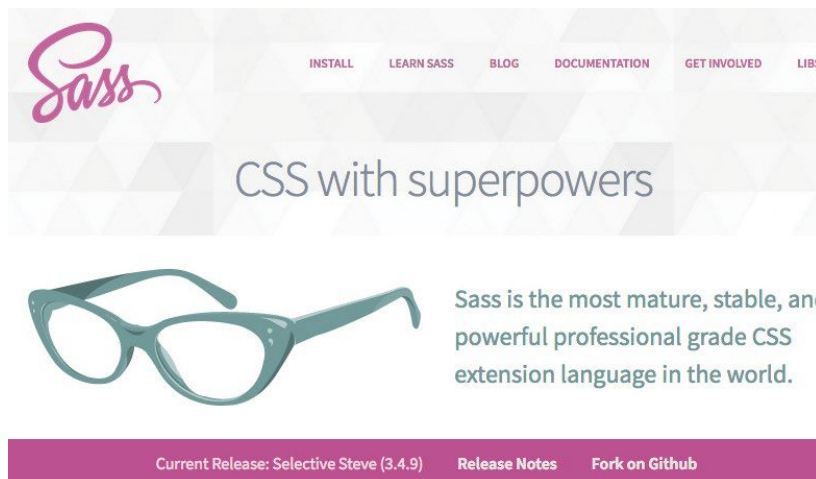
It's important to remember that the CSS cascade still applies to code written in Sass. Styles written in partials imported later have the ability to override styles in partials imported earlier.

It's also wise to import partials that contain your mixins and variables at the beginning of your primary Sass file, so that later partials can actually use those variables and mixins.

WORDPRESS COMMENTS

According to WordPress style.css requirements, we need to make sure our compiler preserves the WordPress comments at the top of style.css. When Sass' `output_style` is set to `:compressed`, it strips all comments when it compiles CSS.

Superstar Sass is the most mature, stable and powerful professional-grade CSS extension language



To ensure that those comments are left intact, add an exclamation mark (!) to the beginning of the comment block in `style.scss`:

```
/*!
Theme Name: Sassy WordPress Theme
Theme URI: http://jamessteinbach.com/sass/
Author: James Steinbach
Author URI: http://jamessteinbach.com
Description: From CSS to Sass Sample Theme Code
*/
// Import all your .scss partials below
```

REFACTOR CSS TO SASS

Now that we've broken a long stylesheet into smaller modular partials, we can start to refactor the original CSS to fit our Sass preferences. Some helpful Sass tools for refactoring code are variables, nesting, functions and mixins.

Now we've broken up the stylesheet, we can refactor the CSS to fit our Sass preferences

If you want to change some colours or set up a standard type scale, variables are the best way to save all that data in a single place and make site-wide changes easily. If you haven't already created a partial called `_variables.scss`, I recommend doing that now – and importing it at the top of your main Sass file. Here are some variables you may want to put in that partial:

```
$red: #FF4136;
$blue: #0074D9;
$blue-dark: #001F3F;
$orange: #FF851B;
$type-small: 12px;
$type-medium: 16px;
$type-large: 21px;
$type-hero: 44px;
```

Once you've set up those variables, you can search your partials and replace values with variable names:

```
body {
  color: $blue-dark;
}
.page-title {
  font-size: $type-large;
}
```

You can use a Sass feature called ‘nesting’ to help make complex selectors more readable. Your starting CSS may include styles for multiple elements in the site sidebar:

```
.sidebar h1 {
  //styles
}
.sidebar p {
  //styles
}
.sidebar ul {
  //styles
}
```

You can nest styles inside of other style blocks and Sass will combine selectors to create the complex selectors. The code below will compile to the same output as the original CSS (as shown in the code above).

```
.sidebar {
  h1 {
    //styles
  }
  p {
    //styles
  }
  ul {
    //styles
  }
}
```

In nesting `&` can be used as a placeholder for the entire string of selectors above it. As nesting puts a space between selectors, it can be helpful when using pseudo-classes and pseudo-elements:

```
a {
  color: $blue;
  &:hover {
    color: $blue-dark;
  }
}
.clearfix {
  &::before,
  &::after {
    content: "";
    display: table;
    clear: both;
  }
}
```

The `&` can also be used to duplicate or reverse the order of selectors:

```
p {
  & + & {
    margin-top: 1em;
  }
}
.menu-link {
  color: $gray;
  .menu-item:hover & {
    color: $gray-light;
  }
}
```

You may be wondering if it’s worth your time to refactor by nesting properties. While nesting may increase readability (although this is subjective), it’s also a tool to be used carefully. Most Sass experts recommend an ‘Inception rule’ for Sass nesting: never nest more than three levels deep. It’s wise to use Sass nesting sparingly. If it doesn’t make sense in your workflow, don’t force it.

If you’re repeatedly calculating certain properties in your CSS, you can replace that process with a Sass function. A function takes the parameters you give it and returns a value. It won’t generate CSS property-value pairs, but it can generate values for you.

Here’s an example of a function to calculate faded colours on hover:

```
// This goes in _functions.scss:
@function hover-color($color) {
  @return lighten($color, 10%);
}
// This is how you use the function in other partials:
.button {
  background-color: $red;
  &:hover {
    background-color: hover-color($red);
  }
}
```

We can also refactor our code by taking repeated blocks of code and replacing them with mixins. A great example of a useful mixin is a clearfix.

```
// This goes in _mixins.scss:
@mixin clearfix() {
  &::after {
    content: "";
    display: table;
    clear: both;
  }
}
// This is how you use the mixin in other partials:
.content-container {
```



Micah Godbolt’s ‘Get Your Sass in Line’ presentation covers how to share Sass files in an organised way netm.ag/godbolt-265



* RESOURCES

FURTHER READING

+ Here's a run-down of some good places to look if you want to explore further. The first several articles are specific to WordPress developers getting started with Sass. The rest of the links offer broader insight into good Sass organisation and maintenance processes.

'Sass for WordPress developers' by James Steinbach (netm.ag/steinbach-265) – This article introduces WordPress developer to Sass and recommends some useful tools

'Compass compiling and WordPress themes' by Chris Coyier (netm.ag/coyier-265) – Discusses methods for using Sass to generate a WordPress-compliant stylesheet

'How to use Sass with WordPress' by Andy Leverenz (netm.ag/leverenz-265) – Walks users through how to set up a local WordPress installation, install Sass and Compass, and start compiling Sass

'Introduction to Sass for new WordPress theme designers' by WPBeginner (netm.ag/WPBeginner-265) – Shows how to use the Koala app to compile Sass in a WordPress theme

'A WordPress development process using Sass and Compass' by Yanko Dimitrov (netm.ag/dimitrov-265) – How to set up folders and file for Compass-compiled Sass

'Architecture for a Sass project' by Hugo Giraudel (netm.ag/giraudel-265) – Some great ways to organise files in a Sass project

'Sass partials and the problems surrounding them' by Tim Whitney (netm.ag/whitney-265) – Tim explains the need to organise Sass files well

'How Evernote handles their Sass architecture' by Ryan Burgess (netm.ag/burgess-265) – How a large company like Evernote manages its Sass structure

```

> @include clearfix;
}

```

Mixins can also take parameters to generate customised output. This is very useful for design patterns like buttons or alerts:

```
// This goes in _mixins.scss:
```

```

@mixin alert($color) {
  border-radius: .5em;
  box-shadow: 0 0 .25em 0 rgba(0,0,0,.5);
  border-top: 4px solid $color;
  color: $color;
}

```

```
// This is how you use this mixin:
```

```

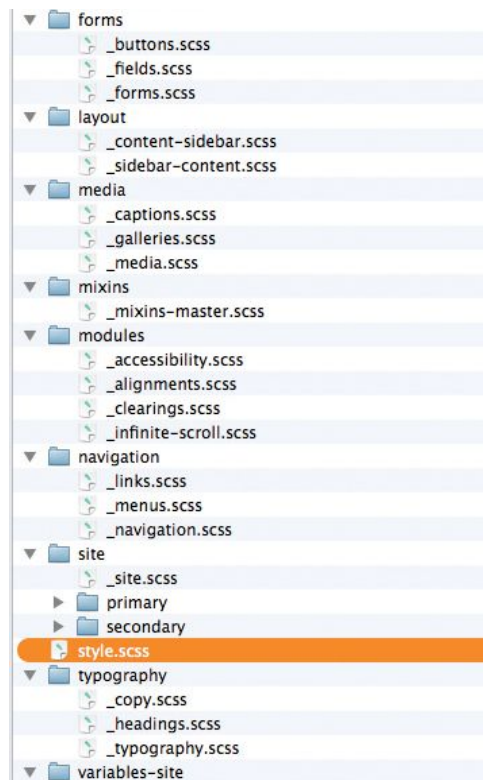
.alert-error {
  @include alert($red);
}

.alert-success {
  @include alert($green);
}

```

One common piece of advice that you may see online is to use mixins for cross-browser prefixing. I usually recommend against this, however. I find that Autoprefixer (netm.ag/prefix-265) is a much better way to automate prefixes.

If you're unable to run Autoprefixer, and have



Sorted partials The underscores.me theme sorts partials into folders including 'elements', 'forms', 'layout' and 'media'



In this 'Getting Sassy with WordPress' presentation at WordCamp NYC, Tracy Rotton explains how Sass helps WP developers and gives an overview of some of Sass' powerful features netm.ag/rotton-265

VARIABLES

Variables allow you to easily organize and update values repeated globally in a project.

NESTING

Nesting allows you to organize Sass visually and generate complex selectors dynamically.

FUNCTIONS

Functions allow you to calculate values based on global variables and passed variables.

MIXINS

Mixins allow you to create blocks of styles that can be modified by passed variables.

Organising your CSS With Sass, developers can use tools like variables, nesting, functions and mixins to organise and automate their CSS

to rely on Sass mixins, Compass' mixin library (netm.ag/support-265) allows user configuration and stays up-to-date with CanIUse data (caniuse.com).

ORGANISE YOUR PARTIALS

To recap, we've taken the theme's existing stylesheet apart and refactored some code to make things cleaner and Sassier. Now we can organise our partials to improve maintainability in the long run.

Remember that the cascade still matters. Sass-compiled CSS is just like plain CSS in that styles that appear later in the stylesheet can override styles that appear earlier. As a rule, import your general styles before you import specific styles.

Remember that the cascade still matters. Import your general styles before you import specific styles

Similar partials can be organised in folders. There are two ways to import Sass partials from directories. The first is to import each file into `style.scss` including the folder name in the import directive, like this:

```
@import 'base/variables';
// imports _variables.scss from the /base/ directory
@import 'base/mixins';
// imports mixins.scss from the /base/ directory
@import 'base/grid';
// imports _grid.scss from the /base/ directory
```

The second (and admittedly more complicated) method is to create a placeholder partial in each directory that imports the other partials in that directory (next column):

```
// in style.scss
@import 'base/base';

// in /base/_base.scss
@import 'variables';
// imports _variables.scss from the /base/ directory
@import 'mixins';
// imports mixins.scss from the /base/ directory
@import 'grid';
// imports _grid.scss from the /base/ directory
```

Both of these methods import the same partials in the same order. The first method is simpler on the surface, but the second method has the advantage of keeping `style.scss` neat and moving any complexity into the modules it relies on.

There are almost as many ways to organise Sass partials as there are developers trying to organise Sass partials. You'll find several good options in the 'Resources' boxout on page 88.

Here's one fairly simple organisation scheme you could use:

- `/base/` (variables, mixins, reset, typography)
- `/layout/` (grid, header, footer)
- `/vendors/` (plugins, vendors, etc)
- `/components/` (buttons, menus, forms, widgets)
- `/pages/` (home, landing page, portfolio)

SUMMING UP

This article only begins to explore the potential of using Sass in WordPress theme development. Chances are strong that you're eager for more information now, especially if this is the first thing you've read on the subject.

Check out the 'Resources' boxout for more reading around the subject – these articles include several variations on a Sass-WordPress workflow. Some of their advice differs from what I've recommended (especially on the topic of organising partials), but that's fine – find the techniques and workflows that work for you!



ABOUT THE AUTHOR

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w: uxlaunchpad.com

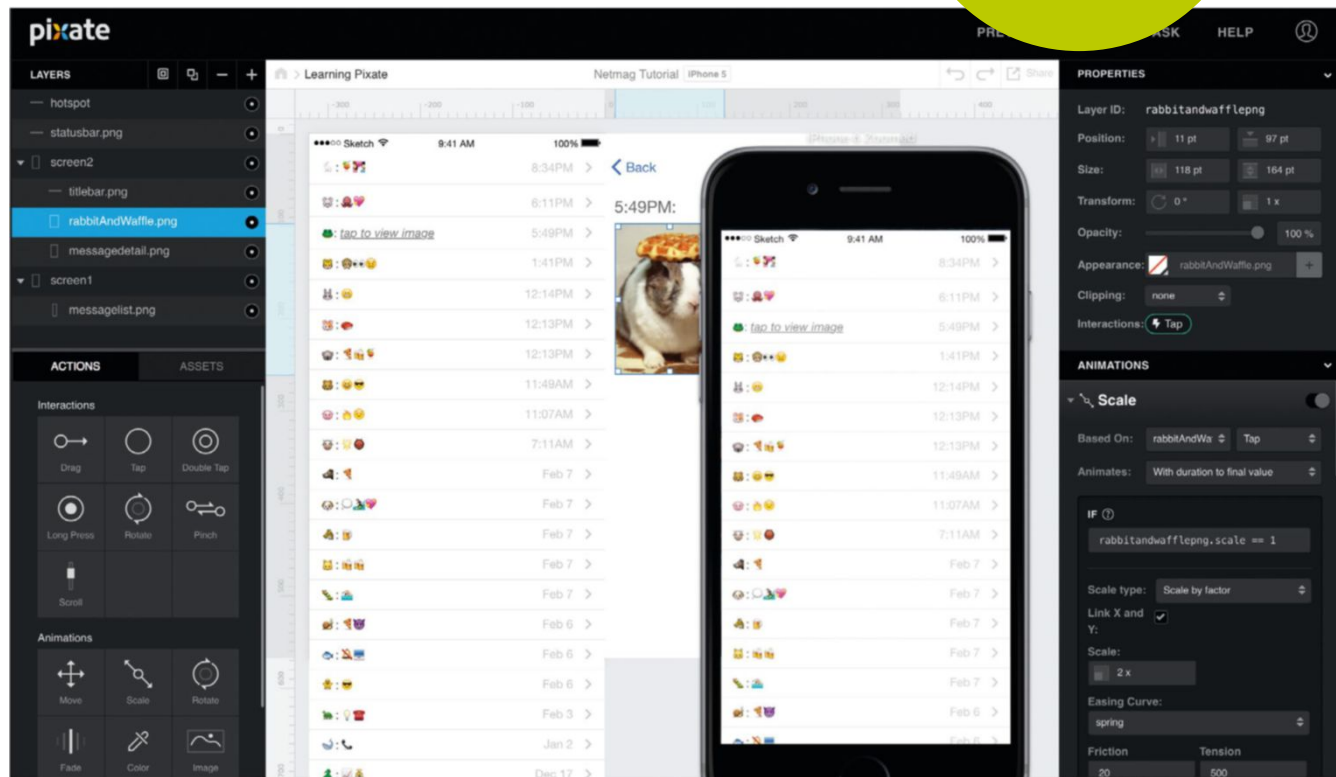
t: @workjon

job: Co-founder, UX Launchpad and designer, Twitter

areas of expertise: Teaching, design, teaching design

q: what's the best thing on your desk today?

a: Sharpie markings from sketching all day



* PROTOTYPING

BUILD A MOVING APP MOCKUP WITH PIXATE

Pixate makes prototyping iOS and Android apps a breeze. **Jon Bell** explains how to use this powerful new tool to build a simple app

> Designers will tell you that design isn't just how something looks, it's how it works and how it feels. Nowhere is this more evident than in the world of app design. Working in Sketch or Photoshop results in nice visuals, but these tools don't do a great job of explaining how the app will feel.

Is the scrolling buttery smooth? When tapped, do images 'pop' into fullscreen mode in a pleasing way? These are the types of interactions that Pixate is great at demonstrating.

In this tutorial we'll make a complete prototype that uses native code, right on your iOS or Android device, without having to learn a new language or a new framework. All you'll have to do is import

some images, add some interactions, and pick your animations from Pixate's helpful and well-designed web app.

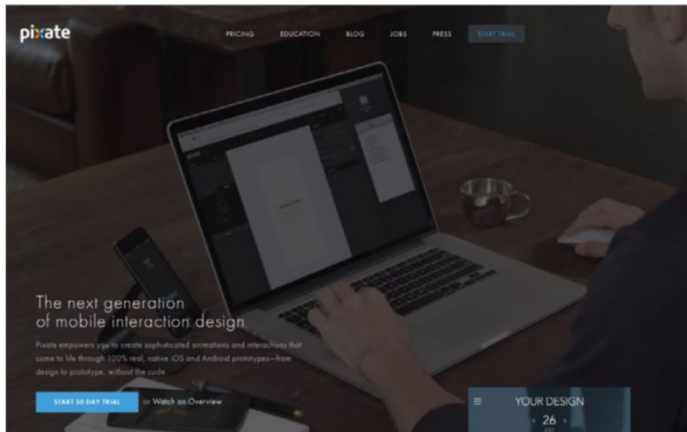
Before we get started, download the assets from netm.ag/pixatepics-265. The package contains the five images we'll need to build a simple emoji-based communication app.

Today Pixate is going to help us understand how to deal with image attachments in our emoji app. Should attachments appear in a separate window? How should the animation look? Should we add a fullscreen mode? Of all the prototyping tools I've used, Pixate is the best at answering questions like these. You're in for a treat!



VIDEO

Jon Bell has created an exclusive screencast to go with this tutorial. Watch along at netm.ag/pixatevid-264



Step 1 Kick things off by signing up for a free 30-day Pixate trial account

01 First of all, go to pixate.com and sign up for an account. The team has just introduced a free version, so you can experiment as much as you like!

02 Start a new project and name it 'Learning Pixate'. Then open a new prototype and select 'iPhone 5' as your screen size. Name it 'Netmag Article' and pat yourself on the back. You're crushing this. You'll be done in no time.

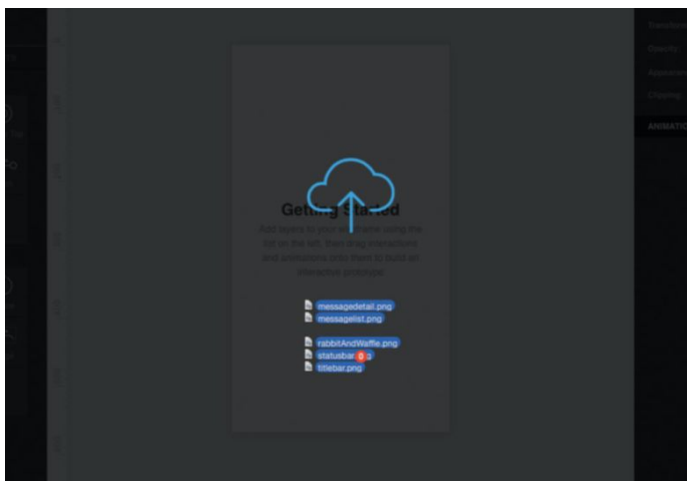
03 Next you'll see the main Pixate interface. Take a look around and get comfortable; this is where we'll be spending all our time. One great thing about Pixate is that it packs a lot of power into a pretty straightforward interface.

The first thing we need to do is upload the image assets that you downloaded earlier from netmag.org/pixatepics-265.

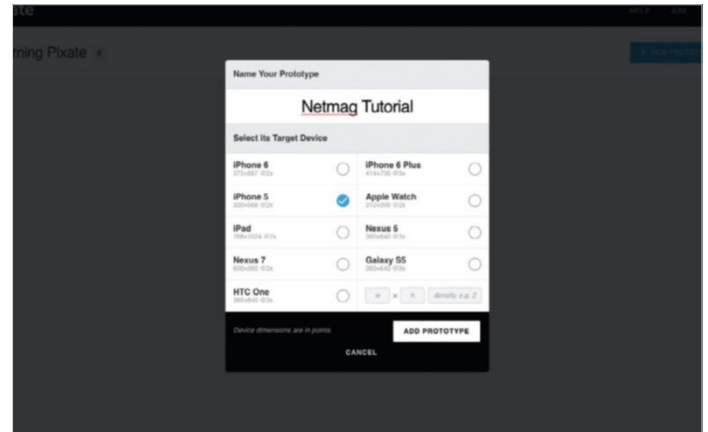
Drag and drop them onto the Pixate website to upload them into your project. It'll take a moment for them to successfully upload and appear in your assets tab.

04 These images aren't on the canvas yet, so let's take care of that next. You'll see each of your assets in the bottom-left screen. Click and drag 'messagelist.png' until it snaps to the top of the canvas. 'messagedetail.png' should sit directly to the right of 'messagelist.png', although this image isn't as tall.

Place 'statusbar.png' at the top of the first screen, and 'titlebar.png'



Step 3 Take a moment to upload the image assets provided



Step 2 Create a new prototype project and select 'iPhone 5' as your screen size

and 'rabbitAndWaffle.png' on the second screen.

05 At the top-left of Pixate's app in Chrome, you'll find a plus sign. Click it and you'll see a new shape added to the Layers area. A grey square box will appear – double-click and name it 'screen1'. Modify the properties area at the right, so the box is set to `left: 0, top: 0, width: 320, height: 568`. Add a second object, name it 'screen2', and change the properties to `left: 320, top: 0, width: 320, height: 568`.

06 At this point, you'll just see a boring wall of grey. We're going to fix that. First change the colour to white by finding the `appearance` drop-down. Click it and pick 'white' from the simple colour picker that appears.

07 We're going to nest items together in the layers area on the left. Click and drag 'messagelist.png' on top of 'screen1' and you'll see them group together. Do the same with 'screen2' by dragging 'titlebar.png', 'messagedetail.png' and 'rabbitAndWaffle.png' onto it. 'statusbar.png' lives on both screens, so make it the first item in your list, not nested in 'screen1' or 'screen2'. Take your time with this – layer order matters!

* EXPERT TIP

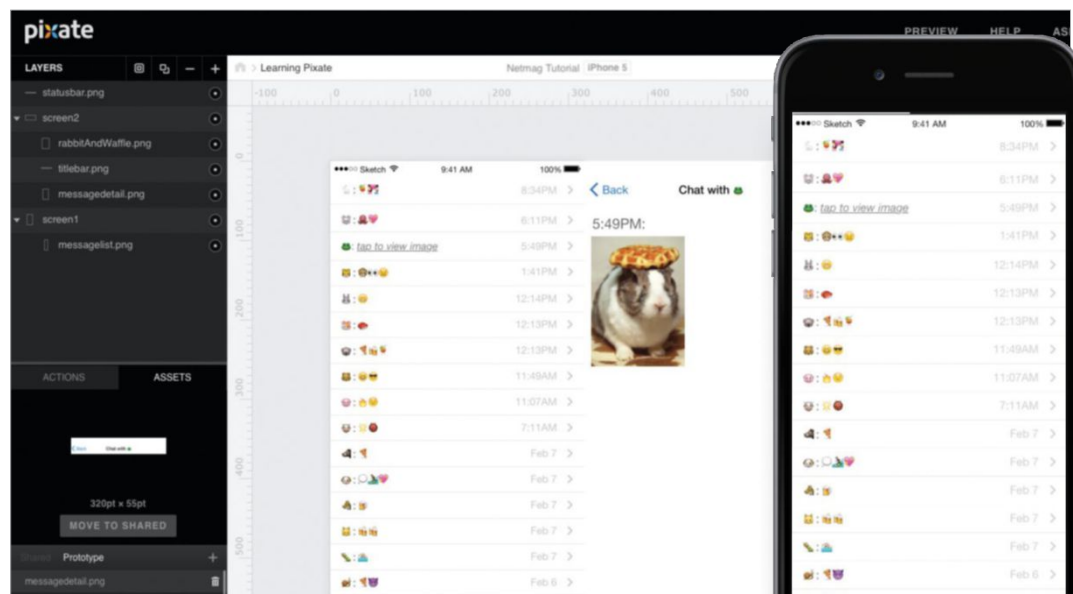
FIND YOUR WAY AROUND

There are only a few regions in the Pixate interface, which makes it really easy to get started. Layers act just as they would in tools like Photoshop – items higher up in the list are stacked higher up on the canvas. Actions handle things like taps and swipes. Assets are where your images live. And properties, the place where you fine-tune everything, takes up the entire right-hand region of the screen. That's it!

08 Next we'll see how the app is looking on a device. Download Pixate for iOS or Android, and once you log in you'll see your projects and this prototype. It's currently pretty boring, but that won't last long. Keep your smartphone out while you use Pixate, because every change you make will magically update on your device.

09 We're going to liven things up by making the list respond to a scroll gesture. In the Actions area, find the **scroll** item and drag it onto 'screen1' in your layers list. After a few moments, it'll automatically update on your phone and it will scroll like a real app. If you're like me, you'll dance a happy jig when you reach this point. This is a big deal! Savour it. Proceed when you're mentally ready to be even more awesome.

10 Now we're going to tie the two screens together. Click the 'plus' sign to get a new shape, name it 'hotspot' and resize it into position over the part of the image that says (tap to view image). It's grey by default, but you can make it transparent (in the colour picker



Step 8 Download the Pixate mobile app to your phone to see your updates live on a device

this is represented as a white background with a red diagonal line through it).

In the layers list, drag the new shape into the 'screen1' grouping. This will soon be our key tappable area in this prototype. It doesn't do anything yet, but we'll fix that in the next step. Allow me to introduce you to Pixate's actions ...

11 In the Actions area on the left side of the screen, drag the **tap** action onto the 'hotspot' shape in your layers list. Now we've registered that your hotspot can accept taps. That's a good start, but we still need to define what we

want to happen on tap. Say hello to Pixate's animations.

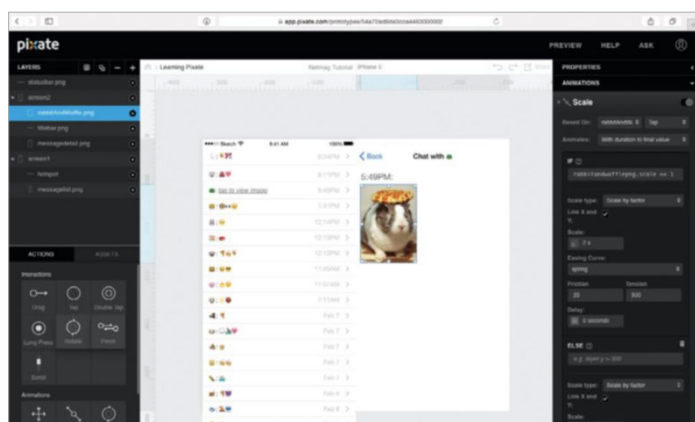
12 Drag the **move** animation onto the 'screen2' grouping in the layers list. On the right-hand side, under properties, you'll see a **move** section with some parameters. There's a section that says **Based on** with two drop-downs. Change them to say 'hotspot' and 'tap' and presto, screen two can now respond when the hotspot is tapped.

13 Define the response by setting **left** to '0' under the **Move To** section. Try it out on your

device – you should see a screen animating in from the right. Triple-tap your prototype to reset it back to the first screen.

14 Now let's wire up a way to link back to the original page so we don't have to triple-tap every time we want to go back. Let's make the '< Back' item tappable by adding a hotspot to it. You know how to do this: drag the **tap** action onto the titlebar layer to make it tappable, just like before.

15 Drag and drop **move** onto 'screen2'. Now you have two different move actions, so scroll

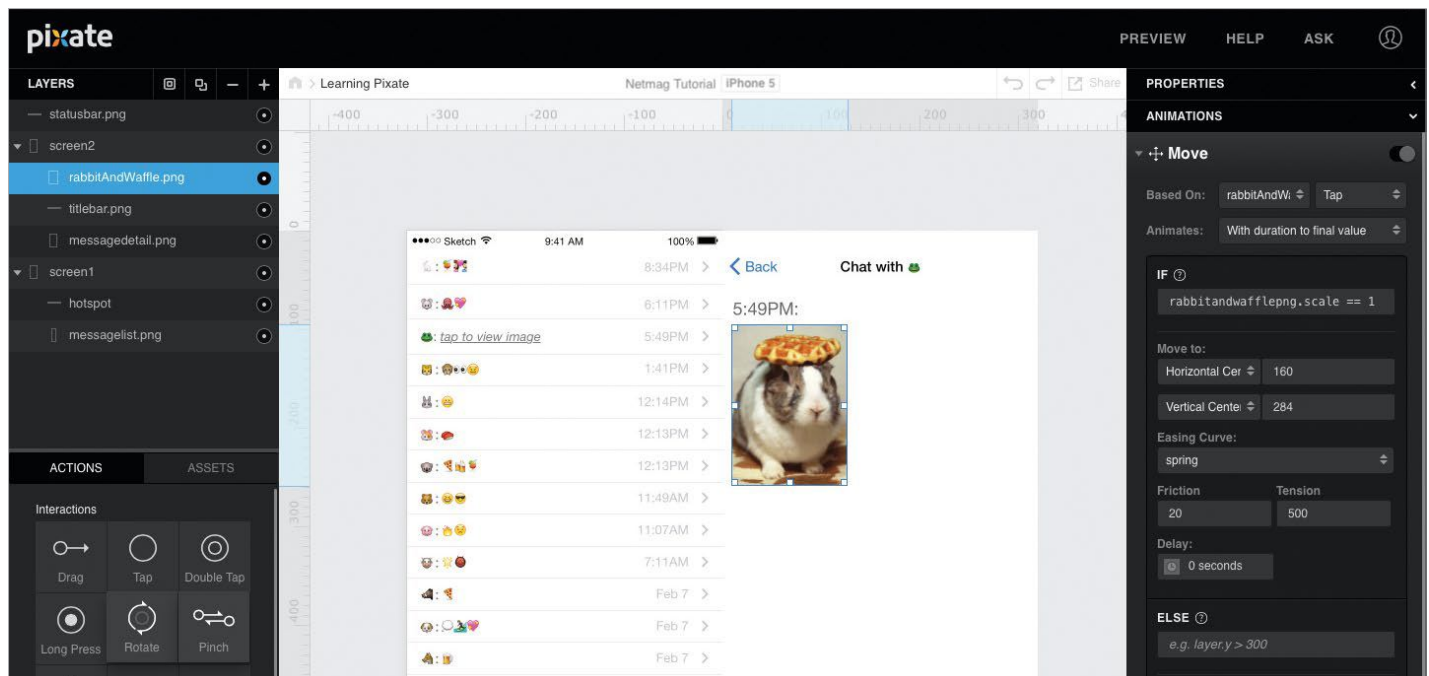


Step 19 We want the rabbit image to double in size when tapped

* EXPERT TIP

MIX IT UP

Pixate's interface encourages experimentation, so play around with all the options in the properties area to see what happens. For example, using a **spring** easing curve makes your app feel completely different to if you use **linear**. Then factor in friction, tension, and different kinds of delays and conditions and you can emulate a wide array of different animations. Give them a shot!



Step 20 Type '2x' under `scale`, and set the `easing curve` to `spring`

down to find the new one we just added. Change the **Based on:** drop-downs to 'titlebar' and 'tap'. Then change the **left** property to '320'. Try this on your device, and you should be able to make 'screen2' animate on and off.

16 Now 'screen2' is doing its job, but we need to make sure 'screen1' is moving too. After all, we want the two images to move in concert, like a single pane of glass. Right now one screen is covering the other.

17 Drag a **move** onto 'screen1'. Change the **based on** drop-downs to 'hotspot' and 'tap'. Set the **left** property to '-320' so it'll move smoothly off-screen when 'screen2' pushes into view. Drag another **move** on 'screen1'. This time base it on **titlebar** and **tap**. Set the **left** to '0' and throw yourself a parade. Or a party. At very least pour yourself a beverage. If all has gone well, your prototype will be able to nimbly navigate between two screens, and that's cause for celebration.

18 Ready to do one last thing? It's a great way to explore some fun animations while I show you about Pixate's condition logic. Let's improve our prototype by making the rabbit image go fullscreen when we tap it. This animation should be a toggle, so when you tap the rabbit again, it returns to its original size. To kick this step off, drag three things onto 'rabbitAndWaffle.png': a **move** animation, a **scale** animation and a **tap** action.

19 In **based on: dropdowns**, for both move and scale, select 'rabbitAndWaffle.png' and **tap**. Notice that both **move** and **scale** have a **CONDITION** section with a text field. Type 'rabbitandwafflepng.scale == 1' into both fields. Above, in the Properties section, make sure **left** is set to '9' and **top** is set to '95'.

20 Scaling will be nice and straightforward – we just want the image to become twice as large. Look for the **scale:** drop-down and type '2x'. Then set

the **easing curve** to **spring**. Next click the blue **+CONDITION** link and under **Scale:** type '1x' and again set the **easing curve** to **spring**.

21 Finally, let's change the positioning. Under **move** look for a pair of drop-downs in the **Move to:** section. Change the first drop-down to **horizontal center** and type '160' in the field. Change the next drop-down to **vertical center** and type '284'. Change the **easing curve** to **spring**.

22 Click the blue **+CONDITION** link and in the **Move to:** section set **left** to '9' and the **top** to '95'. Once again, use the fun **spring** easing style. Then try it out on a device. When you tap the rabbit it should get twice as large and move itself into the centre of the screen. Tapping again should put it back into place.

23 And that's your prototype! Now that you know how Pixate handles actions and animations, you can recreate any interaction in any app. Have fun! **n**

*EXPERT TIP

EDUCATE YOURSELF

This tutorial has been designed to introduce you to a broad range of techniques, but if you want to learn more about anything Pixate can do, check out its great education section at pixate.com/education. There you can find video walkthroughs of all the core techniques, as well as demos of the interactions found in apps like **Tinder** and **Secret**. Be sure to check it out after you've got your feet wet!



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LAMP, HTML, CSS,
JavaScript

q: what's the best thing
on your desk today?

a: I'm framing some band
posters – we're moving
into a new office soon



* TOUCH

DESIGN AN INTERACTIVE TOUCH EXPERIENCE

On a recent project, **Richard Askew** built a touchscreen experience that moved away from traditional web principles. Here's what he learnt

➤ Recently, my company – Askew Brook – and another local design company won a contract to work on an interactive touchscreen installation. Although it wasn't something we'd had a lot of experience of, I was keen to take the project on as it used my web development skills to solve a different kind of problem, in a different environment to what I was used to.

First of all a bit of background: our client was a theatre in Leeds that had a very strong and rich history of attracting the leading acts of their time to the theatre. We decided to create a variety show experience that could be built by the user, who in doing so would unlock the theatre's history. You can take a look at the final installation in action at netm.ag/demo-265.

The build was different from a traditional website project in a number of ways:

- It wouldn't be available outside of the theatre
- The kiosk had a fixed screen resolution
- The kiosk could be moved, so an internet connection may not always be available

Was it possible to still build this thing as we would a website? Here's a few things we learnt about designing for touch ...

1 CONSIDER THE PLACEMENT AND SIZE OF CONTACT POINTS

As anyone who has designed and subsequently viewed their website on a mobile device knows, the placement and size of contact points is important. And – contrary to what you might expect – bigger isn't always best.

After the first round of testing we made each contact point bigger. We included controls that

RESOURCE

Global Moxie's Josh Clark regularly talks about designing for touch, in both a practical and theoretical way. His talks are recommended viewing for all web developers
netm.ag/clark-265

managed the overall experience and gave the user the ability to start, clear or even end the show. These were placed around the edge of the screen and made large enough to easily identify and touch – not only making the installation simpler to use and helping the user feel like they knew what they were doing.

The interesting part was at a lower level. There are a number of interactions the user needs to complete in order to build the acts, click through timelines and so on. We found that the contact points for these functions could remain smaller as long as any other actions the user needed to take were close by. Making them large and moving them away from that specific area made everything more difficult. That's Fitts' Law (netm.ag/fitts-265) in practice!

2 MANAGE EXPECTATIONS

These days, when someone says 'touchscreen', you automatically picture a tablet or a smartphone. We weren't dealing with those types of touchscreens in this project, but – crucially – people were expecting our creation to react in the same way. Tablets and smartphones are so ingrained in our thought process, and feel so natural, we automatically apply those mental models to every touchscreen device we interact with.

Crucially, people were expecting our creation to react in the same way as a smartphone

There are plenty of JavaScript libraries that provide these types of functionality, but we found they were never quite as good as the real thing. So we didn't give the user an infuriating experience, we decided to just use what was available with the hardware: they could tap. That was it – no swipe or pinch and zoom. We made sure that contact points looked like buttons and highlighted them when we needed an action from the user.

3 KEEP THINGS PRACTICAL

Our final solution relied heavily on animations, in a Monty Python style, of the variety performers. One of the reasons I really wanted to take the job on in the first instance was the opportunity to work with complicated CSS3 animation in an environment that we could 100 per cent control. As time went on though, a much simpler and more obvious solution presented itself – a good old GIF. It isn't as sexy, but from a practical point of view it was a great help.

The decision to use GIFs suddenly meant that each member of the team, be they design or development, could create and manipulate the animations quickly, dramatically speeding up the project. It also helped when creating prototypes, as we could complete the most visually interesting parts first, and use these to help communicate our final vision to the client.

4 MAKE IT PUBLIC-PROOF

We still needed to load resources, but the fact that the touchscreen unit could move meant that we couldn't rely on an internet connection. If you're in a similar situation, make sure you don't rely on any online service – load all JavaScript, font libraries and whatever else you need locally. This is an obvious one, but one I profess caught me out and caused unnecessary panic on the morning of delivery!

At this point we had completed the build, but our solution was effectively still a browser on a PC – we had to make it public-proof. There are a number of options available for Kiosk software, but we decided to look to other alternatives.

We essentially needed the following:

- A local website to open when the touchscreen unit is turned on
- A fullscreen web page
- To stop users from accessing the system or the address bar to visit unsavoury websites

We found we could create a batch file that would start Apache and launch Google Chrome in Kiosk and incognito mode on startup. It meant we could keep costs down and that there wasn't another layer of complexity for the client's IT team.

5 USE DESKTOP SHARING SERVICES FOR REMOTE TROUBLESHOOTING

We needed a way to access the touchscreen remotely so we could troubleshoot and fix bugs during the testing period. Obviously, we need the touchscreen to be networked to achieve this, and there are a number of options available. We opted for Chrome Remote Desktop to keep things contained, but any desktop sharing service would work.

REFLECTIONS

There are always things that could be improved upon, but the biggest lesson we learned from this project was to embrace the unknown. We don't take on projects if we aren't convinced we can deliver. Although we hadn't done this before, we utilised what we knew and pushed it to new areas – there is always a first time for everything. ■

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q: what's the best thing on your desk today?

a: My mug of bulletproof coffee

* HEAD TO HEAD

WEBRTC VS ORTC

Lisa Larson-Kelley compares standard WebRTC to using the Object RTC API for real-time apps

WEBRTC	ORTC
WebRTC is a free, open project that provides browsers, mobile apps and IoT devices with real-time communications (RTC) capabilities (video, voice, and data) via simple APIs. The initiative is supported by Google, Mozilla and Opera, among others.	Object RTC (ORTC) is a JS API that makes it easier for devs to manage connections and manipulate media streams in WebRTC. It is planned as an additional 'shim' layer to WebRTC. Initiated by Hookflash, it's now supported by Google, Microsoft and others.
CAPABILITIES WebRTC enables browser-to-browser communication without plugins, which allows developers to embed real-time video, audio and data sharing capabilities into web pages and mobile applications. The data shared over this peer-to-peer connection is encrypted by default.	ORTC will be able to do everything WebRTC does, while exposing additional control over media streams and eliminating the reliance on the complex SDP handshake. It also provides enhancements such as control of senders and receivers, as well as communications transport elements.
EASE OF USE FOR WEB DEVELOPERS While you can create WebRTC apps using JavaScript code, the easiest way is to use a prebuilt framework. The typical web developer isn't going to want to deal with the many complexities involved in establishing peer connections and exchanging data – a framework will do much of the heavy lifting for you.	ORTC is object-oriented, making it much more accessible for devs. The ORTC specification enables support for advanced video conferencing technologies that otherwise wouldn't be available via WebRTC, such as scalable video coding (SVC) and simulcast. This will allow you to more easily create Hangouts-like apps.
INTEROPERABILITY WITH LEGACY SYSTEMS WebRTC requires SDP – a format used in older communications methods, compatible with telecommunications/VoIP applications. Sadly, it's not ideal for real-time communication environments where there can be a variety of scenarios.	ORTC provides an object-oriented approach to initiate connections. The API works with functions and events and provides JavaScript Objects as arguments, rather than the clunky SDP offer/answer approach. SDP can still be used with ORTC, but it's not required.
BROWSER SUPPORT WebRTC's three APIs – <code>getUserMedia</code> , <code>RTCDATAChannel</code> and <code>RTCPeerConnection</code> – are built into Chrome, Firefox and Opera on desktop and mobile.	The ORTC shim is still being built – but the specs require that it be compatible with 'modern browsers', and be interoperable between browsers.
VERDICT ORTC provides raw control for those who need it, while still enabling the current WebRTC API. The ORTC API is still very much under development, however, so it's not ready for use in production just yet. Community involvement through experiments and prototyping is encouraged, and needed. So, bottom line – WebRTC for today, ORTC for tomorrow.	

 FACT FILE

GET STARTED

SimpleWebRTC, EasyRTC and Peer.js libraries; service providers like PubNub and Xirsys; and services such as Talky.io and Appear.in offer easy starting points.

REQUIREMENTS

Development requires a standard text editor, a WebRTC-compatible browser, a tool such as Chrome Dev Tools with webrtc-internals to debug, and a webcam and microphone for testing.



ABOUT THE AUTHOR

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GUSTAFSON****w:** aaron-gustafson.com**t:** @AaronGustafson**job:** Founder, Easy Designs**areas of expertise:**

Web standards advocate

**q: what's the best thing
on your desk today?****a:** My vinyl Funko Pop
figurine of Michonne from
The Walking Dead

* HTML FORMS

CREATE SIMPLE, ACCESSIBLE FORMS

Follow **Aaron Gustafson** as he explores web standards solutions that will help you create forms that work perfectly for any user

> HTML forms are probably among the most complex interfaces a frontend web designer has to create. They involve a bunch of different elements, labels, messaging, validation and errors – it's a lot to wrap your head around. From a user experience perspective, they are similarly challenging: a poorly designed form can be incredibly frustrating to complete. And some are so poorly thought-out that they actually prohibit you from being able to use them at all.

It doesn't have to be this way. Web standards provide numerous mechanisms for creating incredibly usable forms simply by being smart about how we write our HTML. Additionally, as HTML is made to be both backward- and forward-compatible, using these tools correctly aligns our efforts with the philosophies of progressive enhancement and universal design (netm.ag/universal-265).

START WITH CLEAR PROSE

The number one problem most people have with forms is poor messaging. Instructions aren't clear. Form labels are vague. There is no indication of what is required. These all present challenges to your users. So when you start thinking about a form, think about how it reads.

Start with an introduction. What does a user need to know about this form to get started? Are all of the fields required? How long might it take to fill out? Will they need to consult any supplementary documents, like their driving license, passport or a utility bill?

Put yourself in your users' shoes and ask yourself what is crucial to know at the outset, then author

your content accordingly. Don't be pedantic or patronising. Get to the point and get out of the way. There are plenty of statistics that show a majority of users don't read instructions because they're long and unfocused. Keeping it brief can increase the likelihood that content will be read.

Of course, given that most users don't read instructions, it is doubly important that the labels you use, supplementary instructions you provide, and overall form organisation be as clear and concise as possible. For example, 'Your Name' is a little more explicit (and human-sounding) than simply 'Name'. If you want to strike a more conversational tone, you could even ask 'What's your name?'

The same goes for explanatory text. Keep it clear and concise. On Web Standards Sherpa's contact form (webstandardssherpa.com/contact), its email field is joined by text about how the information will be used: "We will only use your email address to respond to your message." Super helpful (and reassuring) stuff! Text is the foundation of every great user experience on the web. Start there.

ALWAYS USE A LABEL

Labels serve a critical purpose in web forms: they tell someone what you are expecting from them. As I mentioned, the text you use to label a given form control is incredibly important. But once you have that clear label, it's equally important that you associate it properly with the form control. That's where the `label` element comes in.

The `label` element can be associated with a form control in one of two ways: implicitly and explicitly. Implicit association involves wrapping the `label`

 VIDEO

Aaron Gustafson has created an exclusive screencast to go with this tutorial. Watch at netm.ag/forms-265

ALL FIELDS ARE REQUIRED

Your Name

Your Email

We will only use your email address to respond to your message.

Helpful info Web Standards Sherpa's contact form includes crystal clear advisory information about how your email address will be used

element around the form control. I like to use that approach with radio and checkbox controls:

```
<label><input type="radio" name="confirm" value="yes">
  Yes</label>
```

Here the label "Yes" is associated with the radio button implicitly. Explicit association involves using the `for` attribute, which is an `id` reference to the corresponding form control:

```
<label for="name">Your Name</label>
<input id="name" ...>
```

Text is the foundation of every great user experience on the web. Start there

The reason I like this approach is that it makes it easy to style radio and checkbox controls independently of other input types, without having to resort to attribute selection (which doesn't work in some older browsers):

```
input { /* styles for normal inputs */ }
label input { /* styles for radios & checkboxes */ }
```

When you use the `label` element, you get two magical UX improvements for free:

- 1 The `label` becomes an interactive element that lets you focus or activate the associated form control
- 2 The `label` text will be read out to screen reader users when the field receives focus

Both are hugely beneficial, but the former is especially helpful for increasing the size of the hit target for checkboxes and radio controls for touch-based interactions.

* FOCUS ON

BUTTONS SHOULD BE BUTTONS

+ In the past, web designers have often groaned at the thought of styling buttons. It makes sense: `input` buttons can only have text content (supplied using the `value` attribute) and the `button` element often injects phantom padding that can be tricky to remove.

Unwilling to accept those limitations, many of us began using other elements (`a`, `div` and so on) to act as buttons, relying on JavaScript to trigger form submission. There are numerous problems with that approach, however:

- The `div` element – and `span` and others – is not seen as interactive by assistive technology, so it is not normally focusable via a keyboard, nor is it exposed as an interactive element via a screen reader
- The `a` element is for linking and anchoring within a page, so using it to trigger a form submission can confuse users
- If JavaScript is unavailable or stops working for some reason beyond your control – say, if a major ISP blocks jQuery for all of its customers – no one can submit the form

For these reasons (and others), it's best to let buttons be buttons. I tend to prefer the `button` element as it can contain other elements, but an `input` with a `type` of `submit`, `reset`, or `button` is equally nice. And if the phantom padding gets you down, just apply `appearance: none` (and its vendor-prefixed equivalents) in your CSS and everything will be right as rain.

Filling in Huffduffer uses a simple Mad Libs style for its signup form, encouraging users to complete the sentence. It is simple and clear what is required

* IN-DEPTH

ARIA-DESCRIBEDBY VS ARIA-LABELED

+ ARIA (Accessible Rich Internet Applications) supports two similar concepts: 'described by' and 'labeled by' (via the `aria-describedby` and `aria-labelledby` attributes, respectively). As they are similar, it can sometimes be difficult to choose the appropriate option. Thankfully, however, forms offer a great way to illustrate the difference:

```
<label id="email-label">Your Email</label>
<input ... aria-labelledby="email" aria-describedby="email-note">
<em id="email-note" class="note">We will only use...</em>
```

In this rewrite of another example from this article, both attributes are in play. The difference in how they end up being used is when they are read out. The `aria-labelledby` reference would be read first (in lieu of any `label` associated with the field, explicitly or implicitly), then information about the field would be read (`required` and so on), and finally the `aria-describedby` reference would be read.

This simple example is good to keep in mind when you are considering using these attributes to improve the accessibility of your interfaces.

It's worth noting that more goes into determining the label and description than just what I've shown you here. In fact, the W3C has outlined a decision tree for determining that value of each of these components (netm.ag/decisiontree-265).

In order of preference, a field's label is one of the following:

1. The target of `aria-labelledby`
2. The value of the `aria-label` attribute
3. The associated `label` element
4. The contents of `placeholder` (because people abuse it)
5. The field's `title` attribute

Descriptions come from `aria-describedby`, `placeholder`, or `title`, in that order.

► USE PLACEHOLDER TEXT

Sometimes it can be useful to provide users with a hint about the information you are requesting in the field. Most often this takes the form of an example you want to show before the user has entered any content, but that you want to go away when they start typing.

In the past we often resorted to using JavaScript to insert and remove values for the field to accomplish this. However, the HTML5 `placeholder` attribute provides that functionality natively. To use it, simply supply a value and it will appear in the field when it has no value:

```
<input placeholder="Johnny Appleseed" ...>
```

The placeholder remains when the field is focused, and doesn't disappear until your user starts typing. Note: do not use the `placeholder` attribute in lieu of a `label`. You can visibly hide a `label` element (using CSS) if it is superfluous in the design, but the placeholder is not a disappearing label. It is intended to provide example content for the field.

ASSOCIATE HELPER TEXT

As I mentioned earlier, there are times when we can reduce our users' frustrations by providing helper or advisory text for a field. We typically display this content next to the field or beneath it in a design. That's useful to sighted users, but it would be useful to everyone if it could also be read aloud when the field is focused.

This is a perfect place to use the `aria-describedby` attribute, which is part of the ARIA specification (see boxout opposite for more on this). This attribute requires a value of one or more `id` references (similar to the `for` attribute), with multiple values separated by spaces:

```
<label for="email">Your Email</label>
<input id="email" aria-describedby="email-note" ... >
<em id="email-note" class="note">We will only use your email
address to respond to your message.</em>
```

HIGHLIGHT REQUIRED FIELDS

In the past, we've relied on symbols like the asterisk (*) to indicate that a field is required, but HTML5 gave us a way to do it declaratively, using the `required` attribute. This attribute is a boolean attribute, which means including it makes the field required:

```
<input required ...>
```

This would ensure any browser that implements the HTML5 form validation API would not submit the

form if there was not a value for this field. Sadly, at present, screen readers don't get this information, but there is an ARIA attribute equivalent: `aria-required`. Including this attribute with a `"true"` value will announce that the field is required in the form:

```
<input required aria-required="true" ...>
```

FLAG UP ERRORS

Last but not least, when we encounter a form submission error, we need to provide the details of the error(s), accompanied by quick and easy ways the user can fix them. By default, browsers that implement the HTML5 form validation API will focus the first field with an error and provide some basic error messaging based on the type of error encountered.

It is possible to customise those messages using `setCustomValidity()` (netm.ag/validity-265), but I'll leave that for you to explore on your own. Instead, let's focus on how we display server-side validation errors. When the server encounters an error with

It can be useful to give users a hint about the information you are requesting in the field

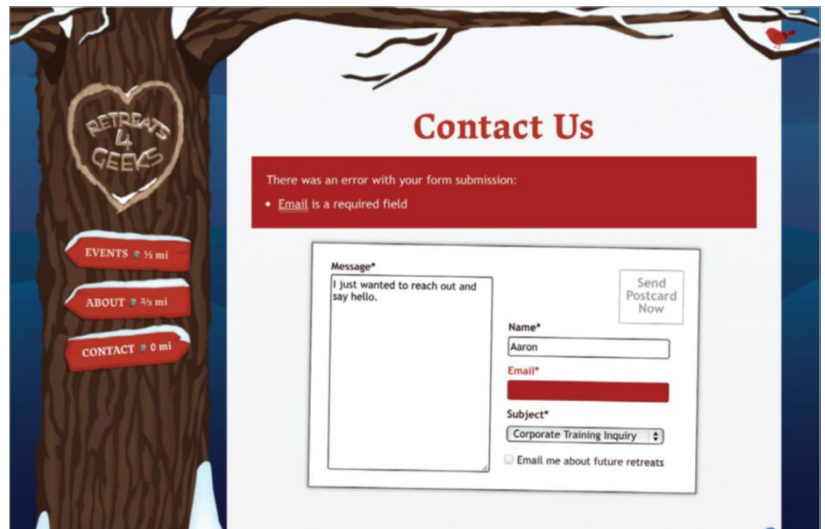
a form submission, it's a best practice to redirect the user back to the form, pre-populated with the information the user submitted.

The fields with errors should be indicated in some way. It's common to see the field outlined in red to show that there's something wrong, but I also like to include an additional visual indication that does not rely on colour. For example, an `x` in front of the label:

```
.error label::before { content: "x "; speak: none; }
```

This uses generated content in CSS to insert the character and tells screen readers (well, future screen readers ... it's not well supported yet) not to read it. Of course, just telling someone a field has an error is not very helpful. We should provide a message indicating why there was an error and/or how to fix it. We already have a pattern for advisory content like this:

```
<input ... aria-describedby="email-error">
<em id="email-error" class="error-msg">Your email address
does not appear to be valid. Please double check it.</em>
```



Easy-peasy. To cap things off, we can also tell assistive technology that the field has an error by adding the `aria-invalid` attribute:

```
<input ... aria-invalid="true">
```

If you want bonus points for awesomeness, you could also aggregate a list of errors at the start of the form, with links to each field with an error:


```
<div role="alert">
  <p>There were errors with your form submission:</p>
  <ol>
    <li><a href="#message">Message</a> is required</li>
    <!-- errors continue... -->
  </ol>
</div>
```

There are two UX benefits to this pattern:

- 1 Users have a summary of all errors with quick access to each field
- 2 The `role` of `"alert"` tells screen readers to trigger an audible chime and then start reading the content of this `div` immediately when the page loads

GREAT UX BEGINS WITH CONTENT

By now it should be pretty clear that readability can dramatically improve the usability of an interface. It's a pretty simple thing, but when we get wrapped up in all of the cool things we can do with CSS and JavaScript, it's easy to forget.

Hopefully this brief survey of modern HTML forms best practices has given you a handful of simple, repeatable patterns that you can easily integrate into your own work. Your users will certainly thank you for it. 

Fixing problems The contact form for Retreats 4 Geeks offers a complete list of errors, with links to the field so users can fix them immediately

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* JAVASCRIPT APIs

PAGE VISIBILITY

Aurelio De Rosa explains how this new API helps users conserve bandwidth

> As web developers, we have to pay attention to save our users' resources and bandwidth – especially in today's world driven by mobile devices and connections. In the last few years, the W3C and the Web Hypertext Application Technology Working Group (WHATWG) have standardised many JavaScript APIs in order to fill the gap between web and mobile apps in terms of the features available.

Today's browsers are more capable than ever, and with every new release they acquire even more powers. One of the aforementioned JavaScript APIs is the Page Visibility API (w3.org/TR/page-visibility). It's a W3C Recommendation that allows site developers to programmatically determine the current visibility of a document and be notified of visibility changes.

To understand when to use this API, imagine you have an Ajax-driven website that sends a request to a server every second, to detect if new data is available (yes, I'm talking about polling), and then

performs a complex operation with it. Considering the CPU needed and the cost of some data plans, especially on mobile, this process can be expensive in terms of both battery consumption and money.

As long as the user is active on the website, the use of these resources is justified. But if the user pushes the browser tab to the background, sending a request each second is a complete waste. Using the Page Visibility API, we can detect the state of the page and act accordingly to optimise the resources.

This API provides two properties, `hidden` and `visibilityState`, that belong to `document`. `hidden` is a Boolean whose value is `true` if the document (read 'the page') isn't visible, even its smallest part. Typically this happens when the tab is in the background or the browser is minimised, with some exceptions for accessibility tools that act in fullscreen mode.

`visibilityState` is an enumeration that specifies the current state of the document and consists of the following values:

- `hidden`: The document isn't visible at all
- `visible`: The document or a part of it is visible
- `prerender`: The document is loaded off-screen and isn't visible
- `unloaded`: The document is going to be unloaded

The last two values of the list are optional, so some browsers might not support them. Like the `hidden` property, the `hidden` value has some exceptions regarding assistive technologies.

The Page Visibility API also provides the `visibilitychange` event fired when a change of the document's state occurs. An example of one use, which prints on the console the number of times the document's state is visible, is reported below:

```
var views = 0;
function countViews() {
  if (!document.hidden)
    console.log('Visit #' + (++views));
}
countViews();
document.addEventListener('visibilitychange', countViews);
```

This API is supported by the latest version of all major browsers, without the need for a vendor prefix. The support is excellent on mobile browsers too, but in some cases the vendor prefix is still required (caniuse.com/#feat=pagevisibility).

* PROFILE

Aurelio (aurelio.audero.it) is a web developer with a thing for JavaScript and HTML5 APIs. His interests include web security, accessibility and performance. He's also a regular writer, speaker and book author



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shots espresso, two
shots raspberry syrup
and a can of Red Bull,
on ice

* ANGULARJS

BUILD A REAL-TIME APP WITH FIREBASE

Lukas Ruebbelke shows you how to take an AngularJS application and give it real-time capabilities using AngularFire

➤ Imagine connecting an AngularJS application to a fully functional backend in a matter of minutes. Now imagine every client connected to your app would reflect changes to your data in real time. We are going to do exactly that, by taking an existing AngularJS leaderboard application, which only stores data in memory on the frontend, and converting it into a real-time web app using Firebase (firebase.com).

THE LEADERBOARD

First, let's look at how the static version of the leaderboard works. Our leaderboard consists of two main parts: the admin dashboard (where we manage contestant data) and the leaderboard (where we display contestant data in real time).

The leaderboard application consists of an AngularJS service called `ContestantsService` and a controller named `MainCtrl`. The `MainCtrl` delegates all operations that manipulate the `contestants` collection to the `ContestantsService`. This means when we add Firebase functionality to our application, all our changes will be contained in the service and nothing else needs to change.

Displaying contestants

We'll start with displaying contestants' data. In our `ContestantsService` we have created a `contestants` collection that we are making available via the `service.getContestants` method.

```
app.service('ContestantsService', function () {  
  var service = this;  
  var contestants = [  
    {id: 1, lane: 1, name: 'Contestant 01', score: '10'},  
    {id: 2, lane: 2, name: 'Contestant 02', score: '15'},  
    {id: 3, lane: 3, name: 'Contestant 03', score: '20'}  
  ];  
  
  service.getContestants = function () {  
    return contestants;  
  };  
});
```

```
{id: 1, lane: 1, name: 'Contestant 01', score: '10'},  
{id: 2, lane: 2, name: 'Contestant 02', score: '15'},  
{id: 3, lane: 3, name: 'Contestant 03', score: '20'}  
];  
  
service.getContestants = function () {  
  return contestants;  
};  
});
```

Now we have access to the `contestants` collection, we will inject `ContestantsService` into the `MainCtrl` and assign the return value of `ContestantsService.getContestants` to `main.contestants`.

We are also initialising an empty `contestant` object to `main.newContestant`, which we will use to bind the new contestant form to.

```
// We are using the controllerAs syntax  
app.controller('MainCtrl', function (ContestantsService) {  
  var main = this;  
  main.newContestant = {lane: "", name: "", score: ""};  
  main.contestants = ContestantsService.getContestants();  
});
```

With `contestants` available on our controller, we can use `ngRepeat` to display our `contestants` in a table.

```
<tr ng-repeat="contestant in main.contestants">  
  <td>{{contestant.lane}}</td>  
  <td>{{contestant.name}}</td>  
  <td>{{contestant.score}}</td>  
</tr>
```



Lukas Ruebbelke has created an exclusive screencast to go with this tutorial. Watch along at netm.ag/firebasevid-265

The leaderboard page is actually a subset of the admin dashboard, which allows us to use the same controller for both views.

Adding a contestant

In our dashboard, we will add a form that will allow us to add a new contestant. We are showing one input – to update the contestant's lane – but the format is the same for the contestant's name and score.

Here, we have a text input field that uses `ngModel` to bind to a property of `main.newContestant.lane`. We have also added `ngSubmit`, which calls `main.addContestant` when the form is submitted:

```
<form class="form-inline" role="form"
  novalidate ng-submit="main.addContestant()">
  <div class="form-group">
    <input type="text" class="form-control"
      ng-model="main.newContestant.lane"
      placeholder="Enter lane">
    </div>
    <!-- The rest of the form -->
    <button type="submit" class="btn btn-default">Add</button>
  </form>
```

When `main.addContestant` is called, a copy of `main.newContestant` is passed on to `ContestantsService.addContestant` and `main.newContestant` is reset.

The leaderboard page is a subset of the admin dashboard, so we can use the same controller

```
main.addContestant = function () {
  ContestantsService.addContestant(angular.copy(main.newContestant));
  main.newContestant = {lane: "", name: "", score: ""};
};
```

In the static version of the leaderboard, `service.addContestant` creates a fake `id` based on the current time and uses that `id` to add the new `contestant` to the `contestants` collection. I would not recommend using this method in a real application, but it will serve its purpose until it gets hooked up to Firebase.

```
service.addContestant = function (contestant) {
  contestant.id = new Date().getTime();
  contestants.push(contestant);
};
```

Race to Awesome

Lane	Contestant	Score	
4	Speedy Gonzalez	6	Remove
5	Lukas Ruebbelke	4	Remove

Add Contestant

Race to Awesome

Lane	Contestant	Score
4	Speedy Gonzalez	6
5	Lukas Ruebbelke	4

Updating a contestant

Updating a contestant is slightly simpler in the static version of the leaderboard, as updates to the contestant object are immediately stored in memory. In the dashboard, we will replace the simple binding in the table cell to a text field that we will bind to that property on the `contestant`.

For instance, the markup below:

```
<td>{{contestant.lane}}</td>
```

... will become:

```
<td><input type="text"
  ng-model="contestant.lane"
  ng-blur="main.updateContestant(contestant)"/></td>
```

We are using `ngBlur` to call `main.updateContestant` with the `contestant` we are updating, which then gets passed on to `ContestantsService.updateContestant`.

```
main.updateContestant = function (contestant) {
  ContestantsService.updateContestant(contestant);
};
```

We are not actually going to do anything in `service.updateContestant` yet, but it will come in handy in just a moment. ►

Leaderboard When a user updates a contestant in the dashboard view, that change is immediately sent to everyone connected to the leaderboard view

★ FOCUS ON

ANGULARFIRE CHEATSHEET

+ AngularFire is the officially supported Firebase library that allows us to bind an AngularJS collection to a Firebase endpoint. AngularFire enables our AngularJS collections to be seamlessly kept in sync with the Firebase services. It also provides an easy to use API for modifying the remote collection so that all other connected clients are updated.

- **Read items** `= $firebase(new Firebase(FIREBASE_URI)).$asArray()`
- **Create** `items.$add(item)`
- **Update** `items.$save(item)`
- **Delete** `items.$remove(item)`

Once an AngularJS collection has been initialised with the `$firebase` service, there is an implicit read relationship in that the collection is automatically kept in sync with the Firebase servers. To modify the collection, we must explicitly perform those operations using the AngularFire API, which allows us more granular control over how we update the servers.

You can read more about the library at netm.ag/cheatsheet-265.

```
service.updateContestant = function (contestant) {
  // Already in memory
};
```

Removing a contestant

The final piece of the application we need to talk about is the ability to remove a contestant. In the dashboard, we have an extra column that we will use to add a button that calls `main.removeContestant` with the `contestant` we want to delete.

```
<button type="button" class="btn btn-link"
  ng-click="main.removeContestant(contestant)">Remove</button>
```

The `main.removeContestant` method then passes that contestant on to the `ContestantsService.removeContestant` method.

```
main.removeContestant = function (contestant) {
  ContestantsService.removeContestant(contestant);
};
```

We can now use \$firebase to fetch a real-time collection of our contestants

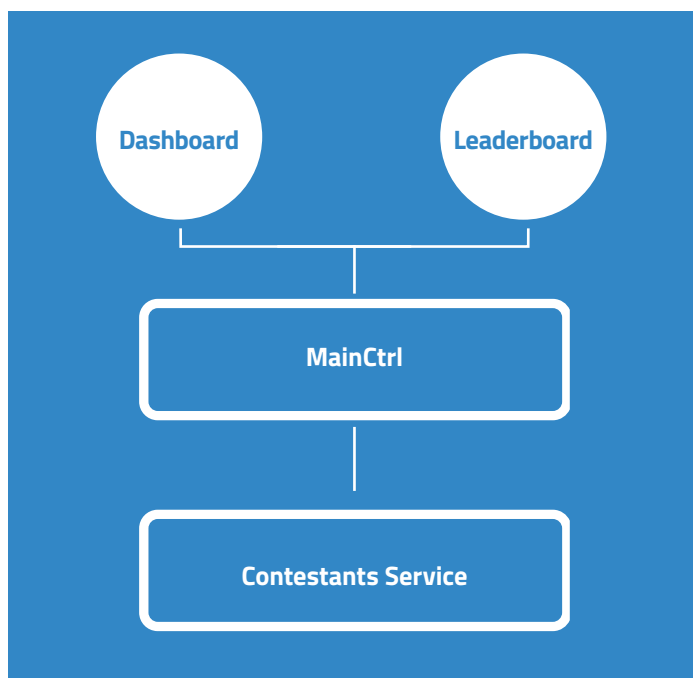
This is `service.removeContestant` uses the `contestant.id` property to remove it from the collection.

```
service.removeContestant = function (contestant) {
  contestants.remove(function(c) { // Sugar.js method call
    return c.id === contestant.id;
  });
};
```

We have now laid the foundation for the AngularJS portion of the application – this is where the fun begins! In the next few moments, we are going to see how easy it is to convert our static leaderboard, with mock data and service methods, into an application with real data that updates in real time.

Setting up a Firebase account

The very first step to creating a Firebase application is setting up a free Firebase account at firebase.com. Next, we need to create a Firebase app instance for our application. From the account page, this will be the first form you see. You just need to give your app a name and hit ‘Submit’ to generate your example



The big picture In this application, we have a dashboard and leaderboard view that uses the `MainCtrl`, which gets contestants data from the `ContestantsService`

and generate a URL based on that application name. Next, we need to add the appropriate resources to our new project.

We will add in the base `firebase.js` file and the `angularfire.min.js` library to our leaderboard. The `firebase.js` file is responsible for managing the synchronisation between the client and server and AngularFire is the official support library for binding an AngularJS app to a Firebase collection (see boxout opposite).

```
<script src="//cdn.firebase.com/js/client/2.1.0/firebase.js"></script>
<script src="//cdn.firebase.com/libs/angularfire/0.9.1/angularfire.min.js"></script>
```

With the appropriate resources added, we need to add the `firebase` submodule to our application.

```
var app = angular.module('leaderboard', ['firebase']);
```

One other thing that I like to do is extract that Firebase endpoint into a constant so that it can be defined once and referenced throughout the entire application.

```
app.constant('FIREBASE_URI', 'PUT_YOUR_FIREBASE_HERE');
```

REAL-TIME SERVICE

The stage is now set for us to convert `ContestantsService` from a static service into a mechanism with real time capabilities. The impressive part is that we will have spent significantly more time establishing context than actually wiring the leaderboard up to Firebase.

We are going to replace the static `contestants` collection with a real-time collection that lives in the Firebase servers.

To do this, we need to inject the `$firebase` service as well as the `FIREBASE_URI` constant we created.

```
app.factory('ContestantsService', function ($firebase, FIREBASE_URI)
```

Within the service, we are going to initialise a new Firebase reference using the endpoint to the Firebase application we just created.

```
var ref = new Firebase(FIREBASE_URI);
var contestants = $firebase(ref).$asArray();
```

We can now use the `$firebase` service to fetch a real-time collection of our contestants by passing in the Firebase `ref` we just created. The `$asArray` method returns a read-only array that we can use with

New application To create a new Firebase application, simply enter in a new application name in the Firebase dashboard and hit 'Create new app'

`ngRepeat`. We can return our `contestants` collection just as before, and the leaderboard will continue to work!

```
service.getContestants = function () {
  return contestants;
};
```

Adding a contestant

Using `$asArray` gives us an array to bind to, but we need to use special Firebase methods if we want to manipulate the collection.

To add a new contestant, we call `$add` on the `contestants` collection and pass in the new `contestant`.

```
service.addContestant = function (contestant) {
  contestants.$add(contestant);
};
```

Updating a contestant

Updating a contestant works almost in an almost identical way to adding a contestant, except we call `$save` instead of `$add`.

```
service.updateContestant = function (contestant) {
  contestants.$save(contestant);
};
```

Removing a contestant

This may come as a big surprise, but removing a contestant is just like the adding and updating a contestant, except we use the `$remove` method and pass in the contestant we want to remove.

```
service.removeContestant = function (contestant) {
  contestants.$remove(contestant);
};
```

Did we really just give a regular AngularJS application real-time capabilities in less than 10 lines of code?

Yeah we did!

RESOURCE

REMOTE MOBILE

Lukas Ruebbelke has created an additional view for a mobile device. It works as a remote, enabling users to alter an athlete's score on the go. Find it in the GitHub repo at [netm.ag/firebasegit-265](https://github.com/netm.ag/firebasegit-265)



ABOUT THE AUTHOR

ANTON MILLS

w: antonmills.com

t: @antonmills

job: Technical director, Holler

areas of expertise:

Creative technology and technical direction

q: what's the best thing on your desk today?

a: A brand new Raspberry Pi A+ I'm using to build a new product with

Score: 0


Lives: 3



*JAVASCRIPT

PUBLISH MOBILE GAMES WITH COCOONJS

Anton Mills shows you how to publish Phaser games to Android mobile platforms using native application wrapper CocoonJS

 Mobile gaming using HTML5 Canvas has come a long way over the past 18 months. It's an exciting time in the industry as it has given app and game developers a new platform to create content for, and as a result a wide range of frameworks have been launched to help developers create better applications. There are now a range of HTML5 game frameworks, such as Crafty, melonJS, Impact and – one of the most prominent at present – Phaser (phaser.io).

One of the downsides of browser-based games on mobile platforms is speed. The browser limits the game's memory use and processing speed. Cue CocoonJS from Ludei (ludei.com/cocoonjs), a platform that allows your browser-based applications to sit

in a wrapper-like native application very similar to PhoneGap and Cordova. CocoonJS features Canvas+, a Canvas-based rendering technology giving mobile game developers who use HTML5 Canvas a significant speed increase for mobile. Very cool.

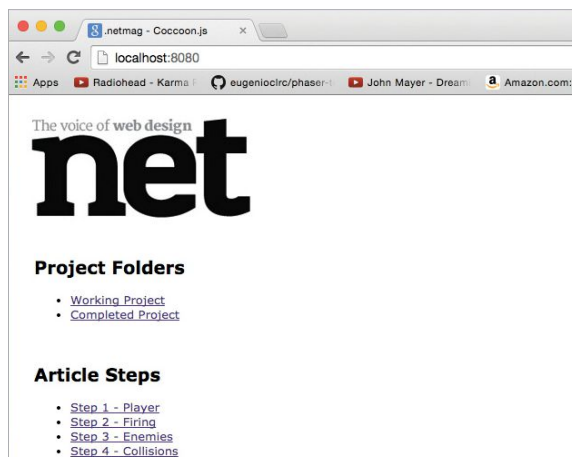
GETTING STARTED

Let's begin by taking a look at the source files at netm.ag/CocoonGit-265. In the root of the project you will find several folders, including:

- **'source-imagery'** – includes the PSDs for the graphics
- **'article-steps'** – contains the source for each of the individual steps, for easy reference

RESOURCE

CocoonJS has some great code examples available on how to use the platform's features. You can find them at github.com/ludei/cocoonjs-demos



Tutorial steps This is the main listing page which you can find at <http://localhost:8080>. It's a handy way to see each step of the tutorial

- **'completed-project'** – contains the final source for the project
- **'working-project'** – this is the folder you'll be working within

You may also notice that the project contains a file called 'gulpfile.js'. We're using Gulp for two elements of this project: to prepare a web server so we can test our game as we develop it, and to prepare a 'game.zip' of the files we need to upload to Ludei's servers for compilation. If

Canvas+ gives devs using HTML5 Canvas a speed increase for mobile

you're new to Gulp, head over to gulpjs.com for usage instructions.

Let's take a peek at the completed project. Open a terminal in the downloaded projects directory and type 'gulp'. This will create a web server you can see by opening a web browser and visiting <http://localhost:8080>. Click on the 'Completed Project' link to see the game running. The controls are the arrow keys, and you use the space bar to fire.

EMULATING MOBILE

While developing for mobile it's best to have the browser emulate a mobile device. In Chrome you can achieve this by going to **View > Developer > Developer Tools**. Look for the mobile device icon in the Developer Tools panel that opens to emulate a mobile device. For this particular project, let's

★ IN-DEPTH

COCOONJS SHOWCASE

+ CocoonJS gives your HTML5 Canvas-based applications fantastic speed increases when publishing for mobile platforms. If you type Ludei into the Apple App Store or Google Play, you will find its Tic-Tac-Toe game, as well as WebGL examples in its LudeiWebGL app – Canvas doesn't just mean 2D games and applications.

When playing these games, it's really hard to tell they are built with web technologies, and it's testament to not only how far web technology has come, but also the strength of the CocoonJS platform to be able to package the games up in a native application wrapper with such excellent performance. You can see more examples of the games built with CocoonJS from third-party developers at ludei.com/showcase/.

Remember, this article was written with game development in mind, and I specifically focused on Phaser because at the moment this is an extremely well-developed game development framework, but you can create any kind of Canvas-based application and use any framework that works directly with Canvas. As you've seen in this tutorial, you can develop locally, emulating a mobile with your Google Chrome or Firefox browser. You can be reasonably confident it will work when it is running with CocoonJS, and because of Cocoon's great Launcher system, it can be ported to mobile in minutes – saving a lot of compiling and publishing time.



CocoonJS showcase Check out examples of games built with CocoonJS from third-party developers at ludei.com/showcase/

★ FOCUS ON

FEATURES, FEATURES, FEATURES

+ We've only really begun to scratch the surface of CocoonJS with this tutorial. The platform itself comes with many features and APIs, including: in-app purchases, advertising, Virtual GamePad, location-based services, motion through sensors and gyroscope, multi-touch, notifications, vibration, application analytics, Facebook integration, App Store integration and Google Play integration, just to name a few!

There are APIs that allow you to interact with the mobile device's hardware itself, as well as convenience functions for rapid integration to various stores and social networks. It is worth noting that not all these features are available without going through the web-based application to become a Premium User. However, the great news is that at the moment there is no additional cost, and the application is just four text fields to fill out and only takes about five minutes to complete. So get in early to test out its wonderful features!

This article has been entirely focused on creating game content for the Android platform, but CocoonJS is capable of reaching a lot of other platforms – such as iOS, Windows, Mac, Nook, Blackberry, Firefox Marketplace, Google Chrome Web Store, Tizen, Facebook Apps, Ouya and more. All of this is possible from Ludei's cloud-based compiler, which takes the stress out of creating content for all these platforms by allowing developers to easily upload their content in a zip file, then sending an email with their content neatly packaged in an app in their chosen format. Magic!

For more information, check out the CocoonJS features page (ludei.com/cocoonjs/features/). It will not only provide more detailed information about each topic, but also sample code and some video content to help you get started with the features.



New features The features page is an excellent place to quickly see just how much CocoonJS offers developers

- specify 1920 x 1080px as the screen resolution at the top of the browser window and then refresh your browser. That looks much better!

I've created a gulp task that prepares a zip file of our content which will be uploaded to Ludei for compilation. Let's test this now. Open a new command window (remembering the other window is still running the web server) and change to your project directory. It should have the `gulpfile.js` inside of it. Run the command `gulp preparezip-completed`. All being well, you should see 'Started' and 'Finished' prompts. You should also now see a 'game.zip' in the folder – this is the packaged file ready for deployment to CocoonJS.

USING COCOONJS

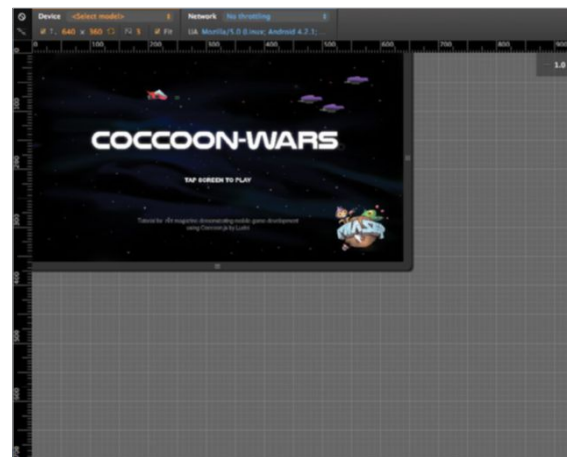
It's time to head on over to ludei.com/Cocoonjs and create an account. Once logged in, head to the 'Dev Portal'. In this section we're going to create a project. Hit the 'New Project' button, make sure 'CocoonJS' is ticked, and give your project a name.

The next entry is to assign your app a Bundle ID – this is a unique identifier used in various application marketplaces such as the App Store. The best practice for Bundle IDs is to choose a reverse domain name (for example, `com.yourname.gamenamehere`).

Give your project a version number of '1'. For the `Scale Method`, select `Scale Aspect Fit` for both the game and the splash screen. Hit `Create Project` and you will be taken to the 'Compile Project' screen, but let's skip this and take a look at creating a Launcher.

CREATING A LAUNCHER

A Launcher is an empty app that allows you to switch its contents on the fly, and save a lot of compiling time. While in development mode on



Emulation mode The SpaceWars title screen running in Chrome's mobile emulation mode – it's handy to develop with this turned on

any project, Launchers are invaluable. Click on the 'Compile Launcher' item from the left-hand sub-menu and choose your development platform (I've opted for 'Google Play Store – Android' for this tutorial).

Tick the box, hit the 'Create Launcher' button and Ludei will compile a launcher with your previously entered settings and you will be sent a download link. In the case of Android, you will be sent a zip file with a signed and unsigned APK file to install to your device. Opt for the signed version and install it as you would any other application.

Run the Launcher app and log in with your Ludei credentials. You will be greeted with a window that requests a URL for the 'game.zip' we prepared earlier. At this point, it's entirely up to you if you want to host the game.zip file somewhere accessible.

As a tip, if your mobile device and your laptop are on the same network and you still have the Gulp web server running, you can use something like: `http://192.168.0.2:8080/game.zip` where `192.168.0.2` is your laptop's IP address.

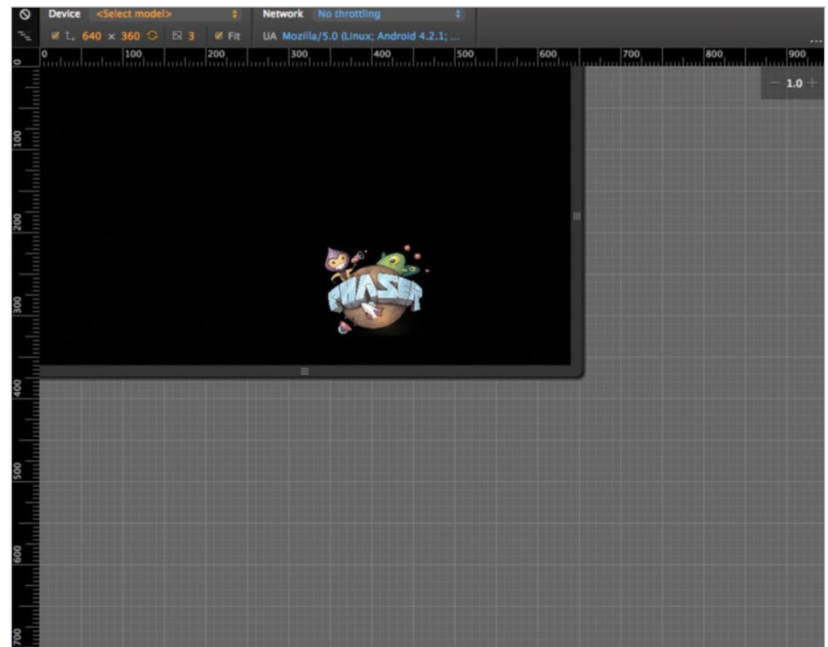
A Launcher is an empty app that allows you to switch its contents on the fly

Once you've entered the URL to the game.zip, press the 'Canvas+' button and this will deploy your 'game.zip' to the CocoonJS launcher and the game should spring to life.

As we continue with this tutorial we will use this method to deploy our progress to the device, the only difference being that we will work within the 'working-project' folder. Now, when we want to compile, we use the command `gulp preparezip-working` and this will compile the contents of the 'working-project' folder instead of the 'completed-project' one.

The working-project folder already has the basics of what we need to start. If you deploy this now using `gulp preparezip-working` you can see a Phaser logo bouncing around your screen. Reloading your mobile device with the newest 'game.zip' is pretty simple:

- Press the 'FPS' text at the top-left of your screen
- Hit the 'Actions' button at the top-right
- Hit 'Reload' – this will grab the contents of the newest 'game.zip'



Placeholder The default state of the 'Working-Project' folder is a Phaser icon bouncing around. It's a perfect placeholder project to build upon

It's a pretty quick way of compiling and testing your work as you develop your games – neat huh?

PLAYER

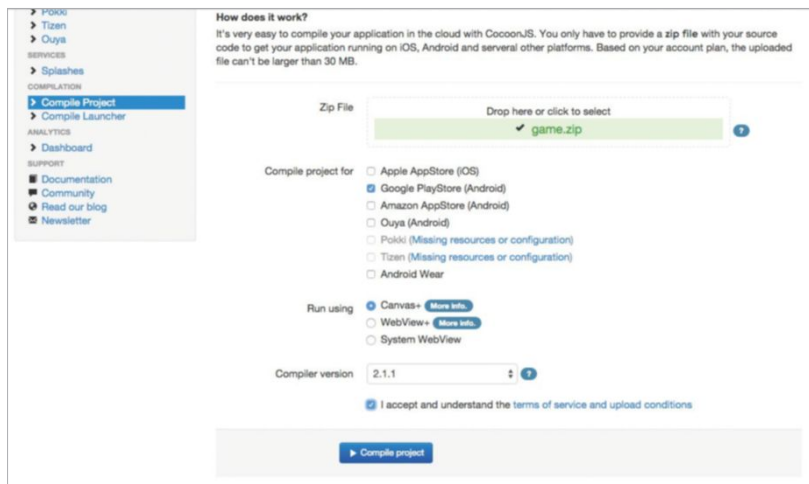
Copy the 'index.html' file from the folder called '1-player' in the 'article-steps' directory, and paste it in to the 'working-project' folder, replacing the existing 'index.html'. We'll repeat this process for each step.

Now let's take a look at the new source code. Near the bottom of the page we have our Phaser boilerplate that sets the game up. We have added a method called `initIntro`, which creates an intro screen image and when clicked, calls `initGame`. `InitGame` has two objectives:

- It creates the interface that (for now) hides the intro image and handles click events (note the `hiddenFireButton` that allows the right-hand side of the screen to act as a 'fire' button)
- The second objective is to invoke the `initGameObjects` method which sets up the arcade-style physics, adds a background image, adds the player's ship and lastly animates it from the left of the screen

The update method is run every frame and checks for both keyboard input and for touch events. `game.input.pointer1` is the first touch event for mobile. If it is down (i.e. the user is touching the screen) it moves the player vertically towards that position. Feel free to deploy this step's source to your device to test.





Compiling for mobile Compiling the game for mobile is easy with the CocoonJS platform

► FIRING

Copying the `index.html` from 'Step 2 – Firing', we can see two new variables added (`groupPlayerLaser` and `fireTime`), and we're adding a new image in the `preload` method. In the `initGameObjects` method we have added `groupPlayerLaser`. This is an `object-pool` – a group of objects that can be reused. We've set the pool size to 40 and set each laser to respond to physics and to die when it leaves the screen.

The `fireLaser` method has been developed further. It now grabs a laser from the `groupPlayerLaser` `object-pool`, fires it towards the right side of the screen and adds a delay using `fireTime` to stop repeat firing.

ENEMIES

In the third folder, 'Enemies', we've added the variables `groupEnemy` and `groupEnemyLaser`, which are two more `object-pools`. `enemyTime` and `difficultyOffset` are both timers that handle the delay of enemy spawning and the 'difficultyOffset' increasingly diminishes, meaning enemies spawn more often as the game progresses.

In the `preload` method `enemy` and `enemyLaser` images have been added to the `preload` queue, and we've added the `enemy` and `groupEnemyLaser` `object-pool` creation to the `initGameObjects` method. It's almost a complete copy of the `groupPlayerLaser` `object-pool` we created in the previous step.

In the updated method there is a new tick against the `enemyTime` and Phaser game timer that calls the new `createEnemy` method if 200ms has passed. `createEnemy` is a new method written that:

- Gets an enemy from the `object-pool`
- Places it at the right side of the screen at a random height
- Sets its velocity to move it towards the player

- Generates a random number to determine if the enemy should fire at the player or not
- If it does, it calls the `createEnemyFire` method

At this point it should be feeling a lot more like a game, but we still need to add some collisions.

COLLISIONS

The last step we'll cover is 'Step 4 – Collisions'. In this step we have added an explosions variable, and in the `preload` there is a new image called 'kaboom'. You might notice this is a spritesheet – an animation that will play when a collision happens. In the `initGameObjects` methods there is yet another `object-pool` called `explosions`, which defines the explosion animation.

In 'update' there are three collision checks: `enemy/player`, `enemy/laser` and `laser/player`. For each collision, check there is a method invoked when the collision has occurred. Each one of these methods usually calls `kill()` on the colliding objects, and if the player is to be reset it invokes the `loseLife` method. `loseLife` simply clears all objects

For each collision, check there is a method invoked when the collision has occurred

off the screen, moves the player to the left side and animates it to a normal position to create the impression of starting again. It also calls `createExplosion`. This method places an explosion animation on the screen at a given X and Y position, and a scale factor to add some variety.

That's essentially it for the core game mechanics. In the 'completed-project' folder I've added in scores, lives and a 'game over' screen for you to look at if you'd like some inspiration on how to elaborate on the mechanics yourself, and create your own version of the game.

Once you've tested this on your device, you are ready to log back in to Ludei, select your project and click on the `Compile Project` link. Here you can customise your app icons by selecting the individual platform sections and uploading your own.

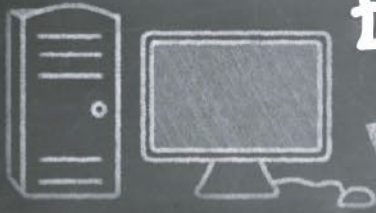
You will also be asked to upload your final 'game.zip' and choose the platforms you are publishing to. You will be sent an email with the compiled applications for each of the platforms. It's a great publishing platform – I hope you enjoy working with it! [a](#)

RESOURCE

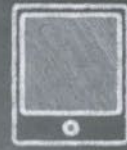
This article is focused on Android and Phaser, but other JS game development frameworks are just as easy to work with. Here's a great iOS and Kiwi.js example: netm.ag/kiwi-265

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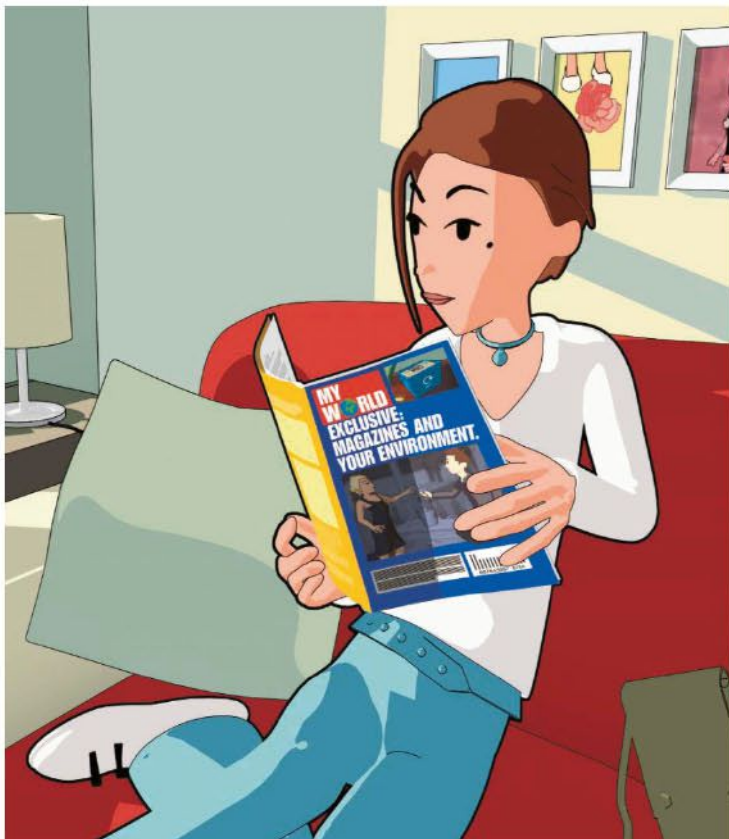
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* ACCESSIBILITY

FOCUS-FRIENDLY

Ian Pouncey gives his three simple steps to ensuring your site is keyboard-accessible and keyboard-usable

> One of the best things you can do to improve the accessibility of any site is to make sure it is both keyboard-accessible and keyboard-usable. There are a few simple steps you can follow to help ensure this is the case.

First, use natively accessible elements (buttons, other form controls, links) for all interactions. Even if you take no further steps, it is now possible for keyboard users to access every control on your site.

Second, define a `:focus` style that distinguishes an element from its default state. It's important keyboard users know which element currently has focus. The mantra to follow is 'Focus First'. When writing CSS, write the `:focus` style first, and when designing, refer to `focus` instead of `hover` styles.

Finally, for more complicated interactions like a carousel or tab panel, manage keyboard focus appropriately. Usually when activating a tab or a 'next' button in a carousel, you want to set the focus on the newly revealed content, so keyboard users don't have to tab through to interact with it. The key is to use the `focus()` method as follows:

```
document.querySelector('target element').focus(); one two  
three four five
```

This will only set focus on natively focusable elements, however. To focus on other elements,

a `<div>` or `` for example, you'll need a `tabindex`. Adding `tabindex="-1"` to an element means it becomes focusable using the `focus()` method, but can't be tabbed to. I like to use a helper function to manage this for me:

```
function setFocus (el) {  
  if (el) {  
    // check element is not a natively keyboard  
    accessible element  
    if (!/^(?:a|select|input|button|textarea)$/i.test(el.  
    tagName)) {  
      el.tabIndex = -1; // set tabindex to -1  
    }  
    el.focus(); // set focus on the element  
    return el; // return original element to enable method  
    chaining  
  }  
}
```

It is called with:

```
var targetElement = document.querySelector('target  
element');  
setFocus(targetElement);
```

And there you have it, three steps to hassle-free keyboard accessibility. ■

PROFILE
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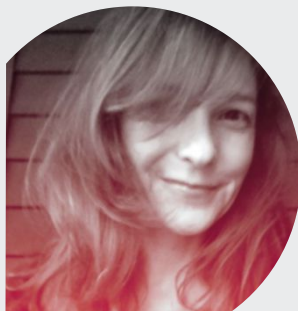
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